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IND

FEBRUARY 1960 25¢

TECH-TIP:  
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OR STREET

*Motorcycle Engines—A New Trend In Kart Racing*

If you can drive you can  
win in a

# SIMPLEX

## Challenger Racer



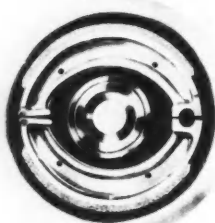
**MARK I**  
*Challenger Racer*  
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### HERE'S WHY ...

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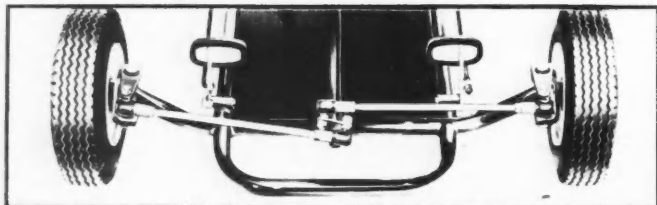
### HERE'S WHY ...

The Challenger brakes are two-shoe automotive internal expanding brakes. Their braking efficiency at racing speeds is proving to be one of the big plus factors in winning races. They permit the driver when approaching a curve to maintain top speed longer than Karts with other type systems which must start to brake much sooner.



### HERE'S WHY ...

The absolute perfection of the Challenger Racers \*Steering mechanism cannot be improved. It represents the ultimate in Racing Kart steering and provides a precise turning radius which completely eliminates tire scrubbing and frictional speed losses on curves.  
\*Patent applied for.



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SIMPLEX CHALLENGER	MARK I	MARK II
	SINGLE ENGINE	DUAL ENGINE
Standard Retail Price .....	<b>\$189.00</b>	<b>\$269.00</b>
INCLUDES:		
Completely assembled ready to race .....	Yes	Yes
Crated .....	Yes	Yes
Freight Paid .....	Yes	Yes
Chassis completely welded .....	Yes	Yes
Painted—Baked enamel. Black or Red .....	Yes	Yes
TYPE BRAKES:		
Finest automotive two shoe .....	Yes	Yes
Internal expanding brakes .....	Yes	Yes
Internal Band Brakes .....	No	No
External Spot Brakes .....	No	No
Scrub on tire brakes .....	No	No
STEERING:		
Diameter-king pin .....	1/2"	1/2"
Air craft type fittings .....	Yes	Yes
Shake proof fasteners .....	Yes	Yes
Precise turning radii .....	Yes	Yes
ENGINE: Choice of		
Clinton 2 cycle 2 1/2 H.P. ....	Yes	Yes
Lawson 4 cycle 2 1/2 H.P. ....	Yes	Yes
OTHER FEATURES:		
Wheel size .....	5"	5"
Tapered roller bearings .....	Yes	Yes
Fully pneumatic tires .....	Yes	Yes
Hub caps (keep out dirt) .....	Yes	Yes
Foot brake pedal .....	Yes	Yes
Foot accelerator pedal .....	Yes	Yes
Replaceable axles .....	Yes	Yes
Dry air filter .....	Yes	Yes
Rewind starter .....	Yes	Yes
All chain drive .....	Yes	Yes
Front bumper .....	Yes	Yes
Automatic clutch .....	Yes	Yes
Seat side rails .....	Yes	Yes
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2nd Ed., 518 pp., 6 x 9, 398 illus., \$8.75

In simple, non-technical language, this volume gives you a clear picture of engine fundamentals. It explains the meaning of such terms as power, torque, friction, etc., and how they relate to the engine. You get a great deal of information on the causes and cures of engine trouble and the advances made in this field. For example, the volume includes comprehensive discussions of the V-8 engine, valve rotators, liquid petroleum fuel systems and engines, bearing-load analysis, valve types and valve life, modern data on piston rings, chemical and mechanical octane and an important chapter on the latest shop practice. This Second Edition also contains new information on gas turbines, free-piston engines, and fuel injection systems.

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|---|---|
| 1. Fundamental Principles                   | 10. Automotive Lubricants and Lubricating Systems |
| 2. Automobile Components                    | 11. Engine-testing Procedures and Tools           |
| 3. Engine Fundamentals                      | 12. Diagnosing Engine Troubles                    |
| 4. Engine-performance Measurements          | 13. Valve and Valve-mechanism Service             |
| 5. Engine Types                             | 14. Connecting-rod, Piston, and Ring Service      |
| 6. Engine Construction and Components       | 15. Crankshaft and Cylinder Service               |
| 7. Pistons and Valves                       | 16. Shop Practice                                 |
| 8. Automotive-engine Fuels and Fuel Systems | Glossary  |
| 9. Automotive-engine Cooling Systems        | Index   |

### Shows how to:

- correct valve sticking, burning, breakage, valve-face wear, valve deposits
- remove and replace cylinder heads and manifolds
- remove and replace piston and rod assemblies
- check connecting-rod alignment
- analyze bearing failures
- install new precision connecting-rod bearings
- check crankshaft and bearings
- replace precision-insert main bearings, main-bearing oil seal, semi-fitted bearings, and crankshaft
- handle engine testing procedures and tools

## AUTOMOTIVE CHASSIS and BODY

By WILLIAM CROUSE

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Springs, shock absorbers, steering systems, brakes, tires and frames—all components of the chassis are described here and their operation and servicing procedures are explained. You get completely modern facts on such advances as power steering, power brakes, front-end geometry, steering-linkage systems, Ford ball-joint suspension, and car air conditioners.

The Second Edition has been thoroughly revised to include the latest information on auto chassis and body. It includes new material on how to service torsion-bar suspension, air suspension, Saginaw in-line power steering, constant-control power steering, control valve assembly, Pitman assembly, and more.

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|   | Glossary                                     |
|   | Index  |

### Shows how to:

- eliminate car pulling to one side when driving or braking, front-wheel shimmy, steering kick-back, and improper tire wear
- remove and replace tie-rod
- balance wheels
- make manual steering-gear adjustments
- service and repair various types of power-steering gear
- make major and minor adjustments on Bendix and Lockheed brakes
- flush, fill, and bleed hydraulic brake systems
- repair and service car door, trunk lid, hood
- handle body alignment, panel repairs, body painting, etc.
- pump down, evacuate, and charge auto air conditioners

## AUTOMOTIVE TRANSMISSIONS and POWER TRAINS

By WILLIAM CROUSE

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of transmissions, clutches, drive lines, and differentials used in many types of autos. The various automatic transmissions are discussed in detail, including Gyro-Matic, Hydra-Matic, Powerglide, Dynaflo, Fordomatic, and Powerflite. And new Second Edition material shows you how to service Turboglide, Cruise-o-matic, Torqueflite, non-slip differentials, as well as all push-button controls.

### The Author

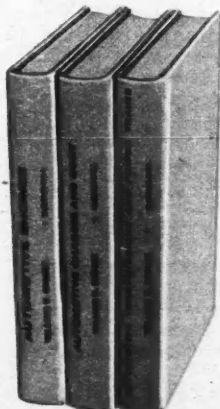
William H. Crouse was formerly Director of Field Service Education for Delco-Remy, and worked at the practical level in General Motors and Delco-Remy plants. He has written several other practical automotive books, and is a member of the Society of Automotive Engineers.

### Shows how to:

- inspect and service clutch parts
- service and repair Long, Borg and Beck, Auburn clutches
- correct hard shifting, transmission sticking in gear or slipping out
- install Fluid Drive, clutch, and transmission
- diagnose rear axle and differential troubles

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# SPEAKING

## of

## the editor



"THAT'S A HOT ROD!" And if the couple surrounding yours truly in the photo above don't know a hot rod when they see one — then no one does. In little less than six weeks from now spotlights will illuminate the car-studded exhibition floor of Oakland's Exposition Building officially opening the eleventh annual National Roadster Show. This largest of West Coast custom automotive shows is staged by Mary and Al Slonaker, longtime avid automotive fans themselves. In the eleven years they have been presenting the huge galaxy of hot rods, customs and sport cars, they have contributed much to the true values of hot rodding and to all specialized automotive interest shared by thousands of young enthusiasts. The National Roadster Show, a showcase for these young ideas, was sired from a generalized automotive exhibit staged by the Slonakers way back in 1949. The show displayed many types of cars, classics, antiques, sports cars both of competition and continental flavor, timely American models and experimentals — and a few hot rods. Needless to say, the few hot rods stole the entire show and due to spectators interest and response the first all-hot rod National Roadster Show was conceived early the following year. Through the years, the show, its prestige, and year round interest, is responsible for the fact that the San Francisco-Oakland area is one of the most productive in the country for quality rod and custom car building. Each year the high point of the show's weekly run concerns the last evening's climax. No sooner have all the trophies been awarded, kisses bestowed, and congratulatory photographs recorded, than down comes the stanchions and railings protecting the cars. Almost as if governed by a count down, over one hundred and twenty-five cars roar to life and commence jockeying for position in a long line that files toward the exit. With engines blast-

ing their rattling staccato, the sparkling show-cars, some, class winners laden with trophies, file out the large door in a wild parade-like cadence. Spectators need no reminder that this is hot rodding's show of shows. Comes Washington's Birthday and you are in the Bay area make sure you take it in. You'll find it an experience in unforgettable automotive glamour.

\*\*\*

Speaking of auto shows brings to mind a very interesting item I read the other day. It's National Hot Rod Association's new 'Car Show Sanction Kit.' Here, for the first time is complete professional guidance to staging a successful car show no matter how big or small. The sanction kit not only offers exclusive advertising benefits, but thoroughly explains and illustrates the procedure of preparing, promoting, staging, classifying, judging and just about anything else you might name connected with presenting a car show. The sanction doesn't come free, it costs twenty-five dollars. Considering the cost, you might as well say that you're hiring a professional for mere peanuts. If your club's activity calendar calls for a show in the forthcoming spring or summer months, then I highly recommend you check in with NHRA and take a close look at this new sanctioning program.

\*\*\*

How 'bout that front cover this month? Can't help but feel that it's a real collector's item — just about the wildest engine cover that has hit the front page of any automotive magazine. If you put on your shades and take a closer look you'll notice that the complete engine is either chrome plated or buffed to a mirror finish. The block? Chromed, naturally! CAR CRAFT's Tech Editor, Geraghty and his buddy John Crawford are the craftsmen.

— Dick Day



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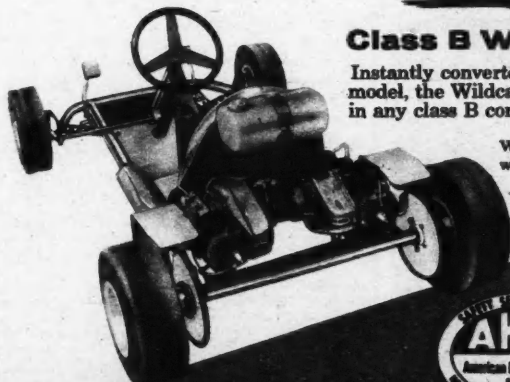
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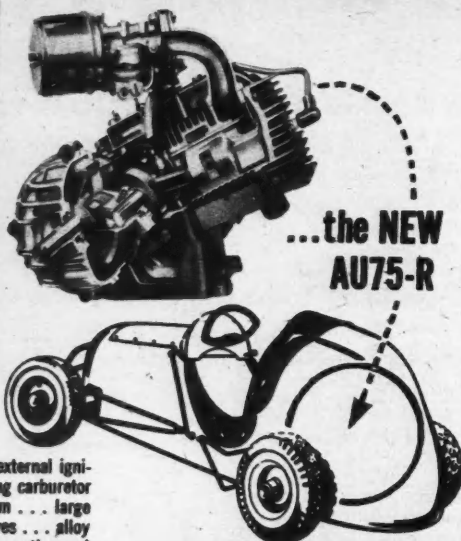
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## cover

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— Anscochrome by Dick Day

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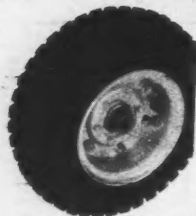
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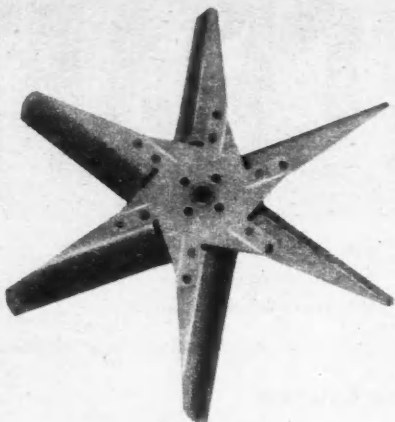
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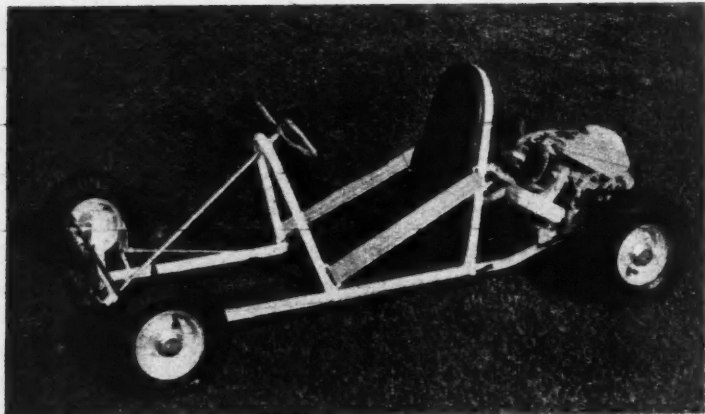
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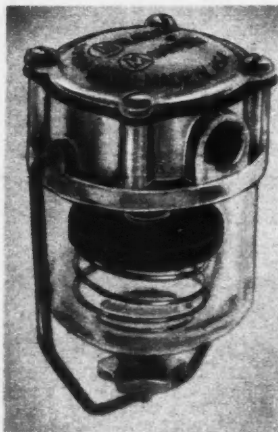
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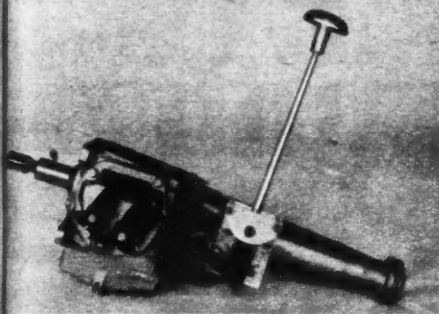
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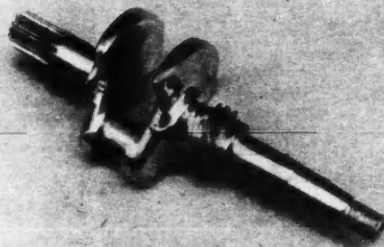
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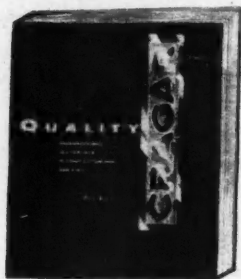
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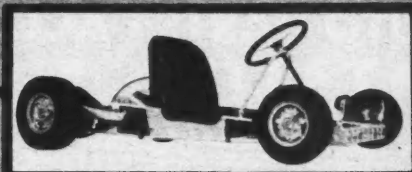
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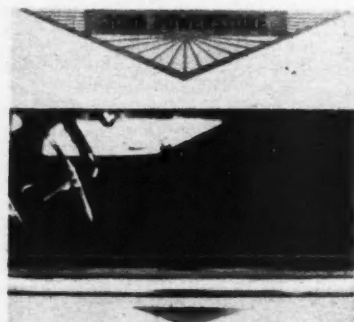
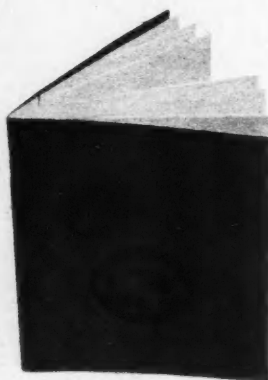
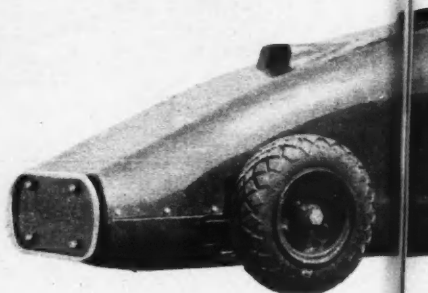
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## WHAT'S YOUR PROBLEM?



SURE, IT CAN BE DONE

Dear Don:

I have a 1954 Mercury that I like to service myself at home. I find this a pleasant way to spend an afternoon until I have to change the oil filter cartridge. As far as I'm concerned it isn't possible to get the filter housing out of the car.

Why would a company as big as Mercury build a car this way?

— Bud Clemons  
Oakland, California

Mercury engineers did create a little problem for automotive servicemen with the engine and chassis combination they have in their '54 cars, but there is a way to get the filter housing out so that it can be cleaned. Incidentally, this same problem and cure exist with some Lincolns.

According to a Mercury shop bulletin the method of removing the filter housing when the car is raised with a jack is as follows: 1. Place the jack under the front frame crossmember and raise the car until the wheels are off the floor. 2. Loosen the oil filter assembly mounting bolt. 3. Turn front wheels to extreme right position. 4. Pull oil filter assembly out between the left-hand front suspension lower rear arm, the number 2 frame crossmember, and the left-hand steering spindle arm. 5. When installing the filter assembly, the front wheels must be at their extreme right position. 6. Return wheels to straight-ahead position and lower car. NOTE: To facilitate loosening and tightening the oil filter mounting bolt, it is suggested that a 3/8-inch drive short ratchet and 3/4-inch socket be used.

Try this procedure the next time you have to change a filter cartridge.

### FROM COLUMN TO FLOOR

Dear Don:

I have a 1955 Ford with a Fordomatic transmission and would like to adapt a floor-shift to the Fordomatic.

Could I use the parts from a '55 T-Bird Fordomatic floor-shift to do the job? If this is possible, what parts would I need? Would it involve much work?

I would greatly appreciate it if you would pass this information on to me.

— Bill Layman  
Pittsburgh, Pa.

It should be possible to adapt a T-Bird transmission control lever assembly to your car by cutting an opening in the floorboard and then shaping the metal around the opening to match the shift lever housing. You would have to either replace or rework the manual control lever on the side of the Fordomatic to change it from its standard horizontal position to vertical. The best way to find out what you would have to do here is to look at the lever on a T-Bird. You would then probably have to change the length of the rod that connects the manual control lever to the shift lever.

You should be able to determine by now how much work would be involved in such a conversion. As far as I'm concerned it would be much more than the result would be worth.

### DETERMINING REAR AXLE RATIO

Dear Don:

What are the ratios of a 1933 Ford rear axle assembly? Is this assembly strong enough for a '48 full-race Ford engine that has three carburetors and milled heads? What transmission would be best?

— Bobby Quattlebaum,  
Florence, So. Carolina

Rear axle assemblies for 1933 Fords could have any one of three different ratios. These are 3.56 to 1, 4.11 to 1, and 4.33 to 1.

You can determine the ratio in your car with the following procedure. With the car resting on a level surface, place the transmission in high gear. With a piece of chalk, mark one of the rear tires in the center of its area that is in contact with the ground. Now make another mark on the engine's crankshaft pulley in line with a suitable reference point on the engine. While you watch the crankshaft pulley, have someone push the car straight ahead while it is still in gear far enough for the rear wheel to complete exactly one full revolution. The number of complete revolutions the crankshaft pulley made is the rear axle ratio. If the pulley revolved just a little over 3 1/2 revolutions, the ratio is 3.56 to 1; if it revolved just a little over four revolutions, the ratio is 4.11 to 1; if it revolved just a little over 4 1/4 revolutions, the ratio is 4.33 to 1.

A rear end of this type has ample strength for a reworked Ford V8 flathead engine.

Use a stock Ford transmission, possibly with Zephyr gears for higher speeds in low and second.

### NOT A GOOD COMBINATION

Dear Don:

I have a 280 cubic inch hydroplane that has a 285 cubic inch Chevy V8 engine. This is a stock class but a few changes are permitted.

Can a hydraulic lifter camshaft be used in this engine with solid lifters? We tried it but the camshaft disintegrated and ruined the crankshaft and

CAR CRAFT

the bearings. However, I have since heard that it is possible to use such a cam and lifter combination. I would appreciate any information that you can give me on this.

— Ted Knutson  
Seattle, Washington

Solid lifters are sometimes used on cams ground for hydraulic lifters but the results aren't too satisfactory. The problem is that cams for hydraulic lifters don't have clearance ramps to lift the lifters gently to take up the clearance in the valve actuating mechanism before the mechanism opens the valves and to lower the valves gently onto their seats when they close. The reasons for clearance ramps are to reduce shock loads in the valve actuating mechanism and the valves as much as possible and minimize noise in the mechanism.

When using solid lifters on a hydraulic camshaft it is necessary to adjust the valve lash to .002 to .003-inch for all valves to compensate for the lack of clearance ramps. This will reduce noise and shock loads in the mechanism.

One reason for the quick destruction of the cams in your engine may have been due to lack of compatibility between the materials in the cams and tappets. This condition could destroy the parts in a hurry. It is also possible that the high rpms a boat engine must turn, combined with the lack of clearance ramps, could have something to do with the trouble.

At best, a solid lifter-hydraulic camshaft combination is a Mickey-Mouse setup. It shouldn't be too difficult to find a solid lifter camshaft you can use.

#### SIX VOLTS FOR CHEV V8 ENGINE

Dear Don:

I have installed a '57 Chevy engine in my '51 Ford. I would like to use the car's 6-volt electrical system but I don't know what kind of a generator to use. What would you suggest?

— Phil Sanderson  
Corunna, Mich.

You can use any kind of 6-volt generator that can be adapted to mount on the engine. More than likely it will be necessary to make a special bracket for the generator, but this shouldn't be too hard to do.

The pulley on the generator should be approximately the same diameter as the one on the original Chevy generator and it must, of course, have a groove of the correct width for the Chevy belt. Finding a pulley of the correct diameter shouldn't be too difficult because many generator pulleys are interchangeable as far as their hubs are concerned.

Be sure to use a generator regulator that matches both the output of the generator and the car's positive-grounded electrical system.

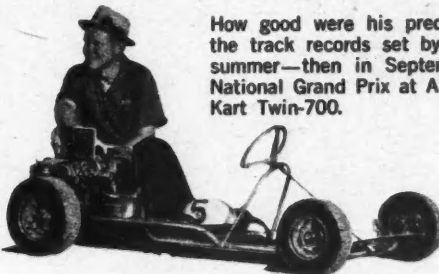
The generator is only part of your problem. You'll also need a 6-volt starter motor and ignition coil. Special starters are available from some speed shops for installations of this type. Use any good 6-volt coil but don't use the resistor that was on the engine for the stock 12-volt coil.

FEBRUARY, 1960

## TWO BIG WINNERS!



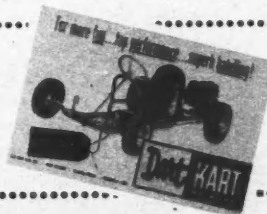
A. J. Watson builds winners...and picks them, too. Here he is with his 1959 Indianapolis Speedway Winner—his third in 5 years. Here, too, is his choice in a winning kart—A Dart-Kart Twin-700 which he picked back in May.



How good were his predictions? The answer is in the track records set by Dart-Karts throughout the summer—then in September, Herb Rupp won the National Grand Prix at Allentown with another Dart-Kart Twin-700.

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**N**EW YEAR'S DAY rang down the curtain on the '59 customs. Last year's innovations, bullets, canted quad headlights, fogged paints had a year of growth and development. Will these continue strong and popular in 1960? Will new ideas spring from mind to metal to replace them? Will customs have the '59 look or a different look? How different?

Detroit has unveiled its '60 models: radical changes at Ford, conservative changes at General Motors and Chrysler, face-lifting at the Independent and a covey of high-styled small cars from the Big Three. Which will be the top-selling '60 car? Which will make the most popular '60 customs? Will the small car become the custom car of tomorrow?

No crystal ball holds the answers to questions as difficult as these for the question of custom styling is a question of time. The answers lie in the minds of the men on these pages who create the styles and build the cars that will set the custom styling pace for tomorrow.

Early last year *Car Craft Magazine* took a look into the custom future when it asked these men to predict the custom car trends of 1959. I've just completed a post-'59 evaluation of the predictions these men made last year. The answers they gave this reporter last year proved to be amazingly correct. More than 95% of the styling ideas they predicted caught on, became the custom trends of 1959.

Here are their predictions for 1960.

We asked the customizers, "What 1960 car will be the top custom bait of the year?" This year the answers were unanimous: Ford—Ford as the top seller and Ford as the top custom. Only one customizer has any reservations:

**Winfield:** "Ford will be the choice because of its heads-up styling, its clean lines, its uncluttered front design and its single chrome fender strip, but it will be more difficult to customize because of its construction. This will have an effect and Chevrolet, an easier car to work

with, could become the top custom model in '60."

**Barris:** "Ford is the best designed car this year: easiest to work with, greatest potential of any '60 car on the market."

**Neil Emory:** "It is Ford all the way—an easy over all appearance, easy to work from and easy lines to customize." Clayton Jensen, "Chevy has a superior engine and a popular four-speed transmission that will sell a lot of cars for them, but Ford's got the styling and that counts with custom enthusiasts."

**Wilhelm:** "Ford's change-over styling will go big with the younger owners. Ford is years ahead of their earlier boxie styling. You can do anything to the new '60 model."

**Starbird:** "Without a doubt the choice this year is Ford. The most popular model will be the 500 hard top."

"The small cars," Bailon said, "will come in for a long look from custom-minded buyers. All three have a big potential. The only thing holding them back is low horsepower: cus-

# 1960 CUSTOM FORECAST

By Bob Behme

tom-minded car owners want more than 90 hp. Still, even that can be licked. The Falcon is a natural for an engine swap. With extra horsepower in the small cars you could see a lot of them customized.

This was the view of most of the customizers. There was more controversy in the choice of the leading small car, than there was in the selection of the top-selling big car custom.

**Barris:** "As soon as Chevy gets a two door hardtop or a coupe in their Corvair line, you'll see some custom interest. Custom car owners want two door stylings: without it no car can become a real custom favorite. Chevy will make the top small car custom."

**Winfield:** "There won't be much interest in small cars this year: that interest is a long way off. But what interest is slated for '60 will come for the Falcon. Its lines are just as clean and exciting as those on the big Ford."

**Wilhelm:** "Falcon has the edge but

there won't be much interest. If it is inexpensive cars the public wants, you'll see more customizing of older cars long before you see small car customs."

**Valley Customs:** "The cost of cars has risen steadily since customizing became popular at the end of World War II. At that time new cars were difficult to get and owners would buy second hand cars for \$600. They'd spend another \$2000 on customizing and still end up with a one-of-a-kind design at a cost equal to or lower than the new cars.

Now new cars are plentiful but the cost is high. You spend \$3000 for a new car. There isn't money left for much custom work. The picture is reversed: \$3000 for a car, \$600 for custom work. On top of that, the new cars are now semi-custom designed by the factory. We don't have to section the bodies, chop the tops or lower the cars as we used to.

However, the small cars, with a lower price, could give people a chance to get customs at a fair price.

**DARRYL STARBIRD**, Wichita, Kansas: He has several years experience, a prominent national customizer, 5B National Custom Car Show, Body Shop Award, with prize-winning customs to his credit. He is a versatile stylist capable of blending radical and conservative styling ideas into "Year-ahead" designs. Last year he pioneered custom use of handmade plastic taillights.

**GEORGE BARRIS**, Lynwood, California: One of the busiest and most exciting customizers in the country. Barris customs have long had a distinctive, individual styling, recording an amazing number of trophy wins at important national shows. Last year Barris styling ideas included colored wheel discs, unusual grille decorations.

**JOE WILHELM**, San Jose, California: His work is noted for a unified, independent look. Wilhelm's strongly individual designs have created ideas which have been adopted across the nation. Last year he pushed the development of unusual quad headlight designs and radical settings.

**JOE BAILON**, Hayward, California: Radical, inventive and daring. Bailon is consistently one of the nation's top-rated customizers. His work often sets the pace the nation follows. Last year he pioneered canted quad headlights, radical roof fins and candy translucent paints.

**NEIL EMORY and CLAYTON JENSEN**, Burbank, California: These men are the styling team at the Valley Custom Shop. Noted for careful, tasteful, high-styled customs, their workmanship has made their cars consistently winners at auto shows. Last year they pushed ahead the styling barriers on such older innovations as rolled belly pans, multiple taillights.

**GENE WINFIELD**, Modesto, California: Three years ago Winfield won his spurs as a customizer of national importance with three show-stopping customs. Since then he has increased his position and importance, pioneering radical uses of paint and conservative sculpturing with metal. Last year's contribution—multi-hued painting for well known customs.

## BAILON:

Joe Bailon, of Hayward, California, is a forceful, imaginative, experienced customizer noted for radical designs. He has had an active part in solidifying the styling trends of 1959. He sees 1960 as the year of emphasis on headlights and new kinds of sculptured body styling.

Headlights will be the biggest thing this year, Bailon feels. "60 will see more use of six headlights up front," he says, "and each light will have a separate use, turning, high beam, low beam, even parking lights will be worked into complex canted designs."

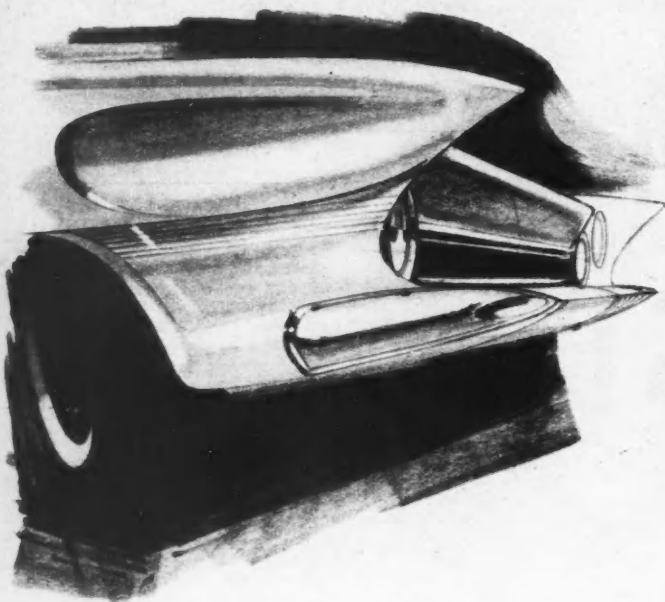
"The lights will be canted, crossed or slanted," Bailon said, "with screens behind them as design. I'm going heavy into six light designs here and it is catching on. I'm redesigning my own 1955 Chevrolet station wagon and the emphasis will be on the front, where three lights in a radical but simple treatment will highlight the only real styling change."

According to Bailon, the second most important 1960 styling trend will be toward the use of sculptured panels similar to the front fender panels on the 1959 Lincoln and the front fender panels on the '60 Plymouth.

"This means building exciting, different concave and convex sculptured areas on to the fenders, body panels, hood and deck lid," Bailon pointed out, "I'm completing a restyled '58 Impala which illustrates what I mean—fins and scoops on the roof and body with sculptured areas on the trunk."

"The first examples of sculpturing will be seen around the fender panels where we'll make different designs, oval, circular and rectangular, to accent and highlight the wheel opening."

"The trend toward larger, full wheel openings is continuing," Bailon claims, "Everyone wants full openings. It is ridiculous to have openings so small you can't pull a tire off the car. Larger



## WINFIELD:

"There will always be room for the radical custom," Winfield says, "but each year the emphasis is shifting perceptibly toward the mild custom. 1960 is no exception. The big move this year will be toward wilder paint jobs."

"This year we'll see more customs that are customs only because of clean-up work and wild paint. The 'clean-up' and 'paint' car will be everybody's custom. That will put the emphasis on wilder, more colorful paint jobs."

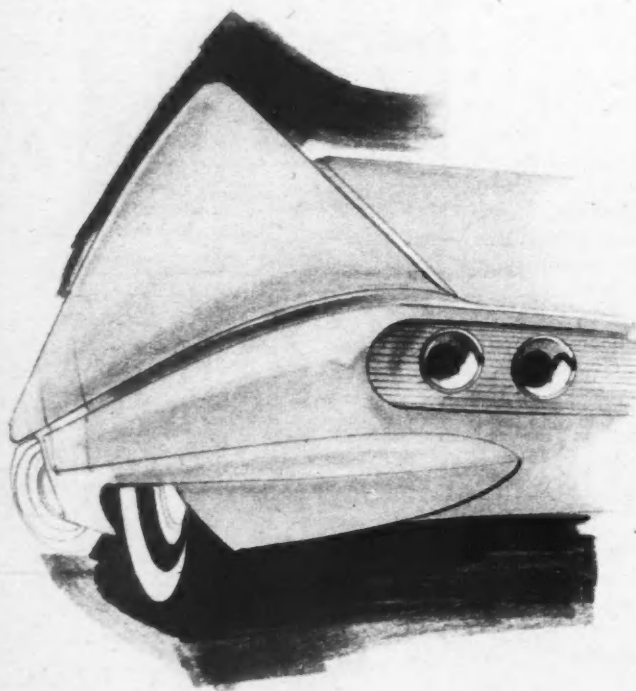
"The Candy colors," he says, "will be popular. Their popularity will probably hold for two or three years. The pearl shades will be most popular of all, especially in the dramatic show cars."

"The candy colors are difficult to take care of and we'll see many street machines moving to the more conservative type of paints. Fogging—the blending of many paint colors to create roundness in paint—will increase in popularity."

"The interest in quad lights will stick through 1960 and there will be more interest in even greater numbers of lights, five, six, even seven or eight, but whatever the number there will be a definite trend toward individual light units in a multiple setting. The individual lights work nicely with the trend toward staggered and canted quad lights."

The move toward the unified bumper and grille will hold but the impact of this particular trend will depend upon the car being customized. On the newest cars the natural choice may well be a '60 Chrysler or a '59 Buick bumper with matching headlights but on a host of older cars the bumper is on its way out: many older cars look better without any bumper.

"There's been a movement afoot for several years to make the rolled pan the center of front end design. The movement has new supporters this year and popularity will grow. Still, like the unified bumper-grille combo, its growth and its use will depend upon





## Metal sculpturing—the new look in '60 customizing

openings, coupled with the new sculptured look, will play an important part in 1960 custom design development."

"There is a definite trend toward the unification of design up front," Bailon said, "but the maturity of the trend is one or possibly two years ahead of us."

"You can spot the first twinges of the trend now," he added, "but it won't really catch hold until Detroit does something more with their ill-designed attempts. That will be at least 1961: the '60 cars show the poorest designed front ends in many years. Detroit designers claim they have bumper-grille unification now: how wrong can you be?"

"The use of bolt-on parts has faded out of the picture in Northern California at least," Bailon asserted, "The kids here won't buy bolt-on customs any more. They want parts designed and built especially for their cars—for example, no welded-on fins, now you've got to design and build special fins from raw metal to a finished product in your own shop. Headlights and taillights are just about the only parts you can now adapt."

Bailon sees the not-too-distant day when all cars, custom and stock, will be high-styled with rolled pans. "It was a big trend last year," he claims, "and it will be even bigger this year."

"There's a big future for the design of belly pans," and with the development of the belly pan will come a diminishing emphasis on bumpers. Today, the bumper is useless: no real protection from any angle. Why use it? We'll be seeing a new interest in nerfing bars which provide more protection than bumpers and integrate into a better design. I've built several customs which bolt on bars to the chassis to protect the owner's car, not the car that hits them..."

There is a trend away from the middle-ground custom. Today we either build a conservative custom or a radical one."



## Chrysler Imperial taillight lenses—top choice for '60

the cars customized. Older cars will use it more as to update them: the newer cars already have it and it will be a matter of emphasis."

One of the most popular taillight units this year will be the Chrysler Imperial unit. It's a beauty. I've already ordered several sets and I've earmarked some for use on a T-Bird I'm customizing. These taillights can be used on many cars. The very popular small bullet-like '59 Cad lenses will carry over into '60.

"The second most popular light will be the rear DeSoto lenses. They are very radical, "way out." These can be used in a horizontal fin, for example, by laying them down.

"There's exciting news in 1960 headlight components. I plan to use the Buick rim leading edge chrome ring in a natural french, one over the other, on Olds and Fords and other older cars. The '60 Olds and Ford units, the individual type, will be even more popular."

"There are several '60 grilles which will prove useful in a variety of cars. The most popular, I think, will be the Pontiac. The Olds grille will have its uses. The rest of the cars should get rid of their grilles and start over.

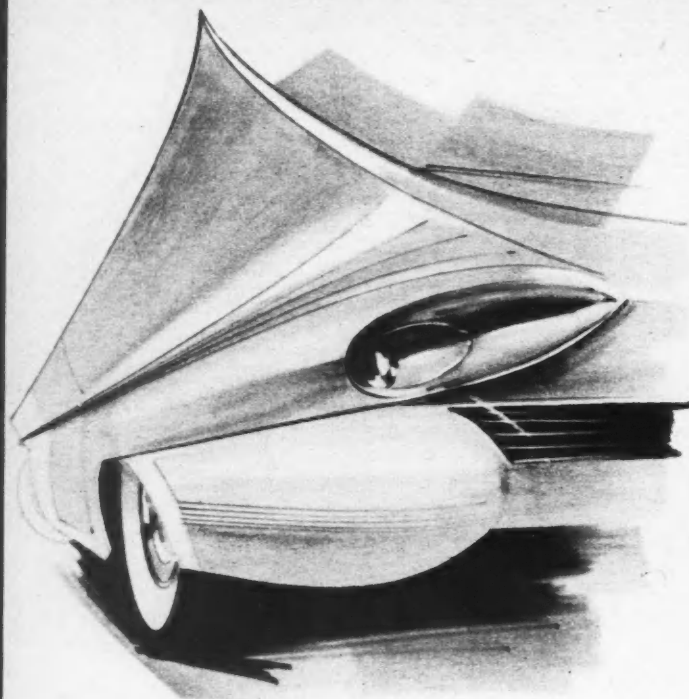
"The bullet grille has become very popular here and will continue to be used in '60. We'll be using bullets in lots of ways, on hubcaps, grilles, anywhere they can be made to work.

The nicest hubcap this year is the Olds 98, and one metal bullet in the center will make this a real disc. Plymouth and Buick have exciting designs."

"Some of the '59 trends, such as bullet grille and fogged painting will continue into '60 but there will be less radical customizing than in the past. Detroit is doing a lot of the customizing on their drawing boards. Most of the '60 cars will look o.k. with clean-up customizing and custom paint."



## CUSTOM FORECAST



## BARRIS:

George Barris has done so many exciting things to so many different kinds of cars his name has become a watch-word among custom conscious car owners. George sees a boom year for custom cars in 1960. "The '60 cars," George says, "embody a lot of ideas customizers have been doing for years. They should make more people custom conscious. Because Detroit is going more and more radical in its stock car designs it helps us become more radical in our custom designs."

"1960 will see a lot of new ideas in new headlights. The trend will go two ways at once: one side will see more emphasis on quad and six light designs—the other side will see a reverse trend toward the use of just one light per side. The number of lights will depend upon the design."

"For example: I'm doing a lot of styling with oval, square, shield and tear drop headlight designs. These are elaborate designs and four of them would be too much: two is enough."

When we use multiple lights we generally use the clear-lensed Lucas sealed beam, canted, slanted or crossed. There will be a continuous emphasis on this in '60."

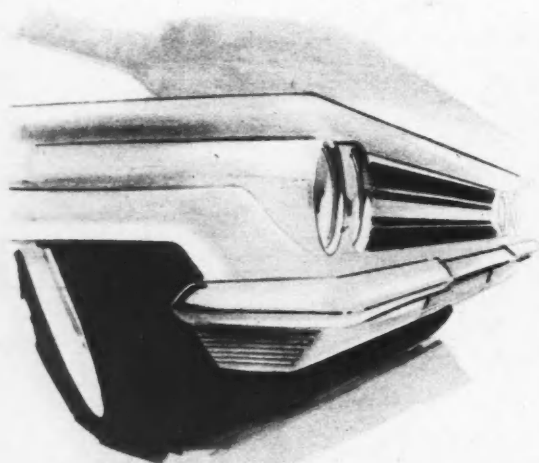
"Fins are here," Barris says, "And they will stay. Fin designs will get larger and larger. We'll see them moving outward with a lot of sweep to them. On the more radical cars the fins will take 'T' and rudder shapes. This will be the year of longer fins and the year customizers start working fins from the front fender to the rear fender."

"For the conservative stylist the '60 Buick taillight will be a very popular choice. For the radical custom, the Imperial and DeSoto will be the logical selection. The simple bolt-on lenses will be the Valiant, because it is canted, and the Corvair, because it is universal in design."

"The Chrysler and DeSoto bumpers and grilles will be very popular but the high price of these units will keep them from becoming universally popular."

"On the other hand, the Mercury bumper and taillight arrangement will be in demand as well as the Edsel taillight. The rear flare styling will be adopted by customers."

"The Buick rear split bumper will undoubtedly see a thousand



## STARBIRD:

"The middle ground custom is gone," laments Starbird, "only two aspects of customizing remains—the low cost 'lead and paint' custom and the very expensive 'show car.' The in-between street custom is losing ground."

"Quad headlights," Starbird reports, "will see no solidification of design, for a while anyway. We'll be experimenting with unique combinations for sometime while we find exactly what our customers really want. For the conservative custom, the '59 Chevrolet quad lights will still prove popular."

"The flat, radically angled fin will set the pace for '60. The really nice part is that this kind of fin can easily be adapted to a lot of the older cars."

"Detroit hasn't offered too much from the standpoint of customizing components this year," Starbird said, "but a few parts can be salvaged. The front of the Plymouth panel, below the bumper, can be used for rolled pans, front and rear, on a lot of older cars. I'm fitting one to a T-Bird now, and the effect is very good."

"The Olds taillight seems to be a highly flexible item. I'm mounting a pair of them on a '55 Chevrolet now. I think the Continental taillights could work nicely in a rear grille-taillight combination. A sample would be Continental lights on the rear of a '58 T-Bird."

"Cadillac has a rear grille with taillights in the bumper which could be fitted to a lot of customs. The Mercury combined taillight and bumper with matching fin is another good idea. The

## Longer fins—from the front fender to the rear

uses. It can be made to work in a hundred styles."

"Bumpers are hardly practical any more," Barris pointed out, "and we'll be seeing the effect of this statement in the styling of '60 customs. There will be far more interest in nerfing bars, tubes and rebuilt (smaller) bumpers."

"With the increased sculptured effect around the wheel openings," Barris says, "there will be new emphasis on wheel discs. Chromed, reversed wheels will be the basis. At the close of '59, there was a trend toward the use of smaller discs in the center section of the wheel only. This will continue."

"We'll be seeing more use of color on wheel discs this year than ever before. Dodge has the hubcap field to themselves again: it will be Moon discs if you want plain discs and Dodge caps when you want fancier ones. Who ever is styling Dodge caps is doing a fine job."

"Continued emphasis will be placed on open rolled pans front and rear with matching pan and grille combinations front and rear: this coming year decorations on the rear pan will simulate the front grille design."

"The gaudy, loud panel stripes and scallops are for the man who wants the cheapie way to a custom. It is out," Barris said.

"You'll see more interest in diamond dust pearl translucent paints, rich translucent candy colors. There will be some new interest in multiple translucent candy colors, blended colors we call fogging, a new way of creating body curvature through paint. The idea should catch on big before the end of the year."

"The bullet grille, the floating tube grille and the candy colors will continue to be popular in '60," Barris feels. "Everyone was looking for a new look in paint and chromed decorations last year. Candy paints gave them the only truly new painting trick in years: the use of household items and bullet decorations up front did the same for decoration. The use of hardware items, such as drawer pulls, will become bigger in 1960: it is an inexpensive and effective way of getting a new look into a grille. There will be more sculpturing around license plates this year and there will be a trend away from the mild customs of '59 toward radical '60 versions."



## Bumper/Grille combinations—more popular than ever

Olds rear bumper is a novel item I plan to use on a future custom."

"The interest in the grille-bumper combination will continue strong and, before 1960 is over, will be more popular than ever," Starbird said.

"Yet," he added, "most of the '60 models use a grille styling that is close to impossible to adapt inexpensively to pre-'58 models because of the tall frontal area and high hood and fender lines you find on the earlier models. A few of them could be made to work."

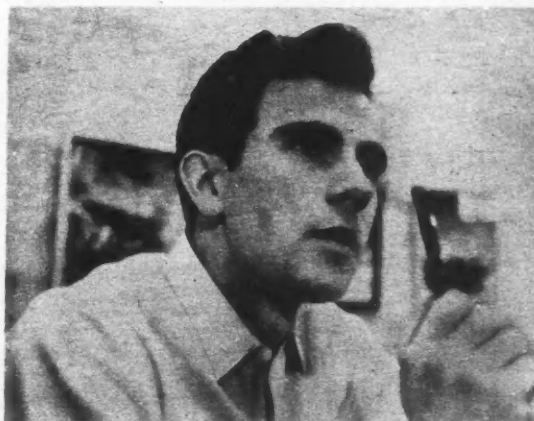
"This year will definitely be the biggest year for rolled pans. With them we'll see the nerfing bar and a change to either a more massive bumper or the bullet bumperettes."

"None of the '60 taillight units will have a strong appeal," Starbird says, "They are simply not universal enough. The upper Cad light is attractive enough, but it has a strictly limited use."

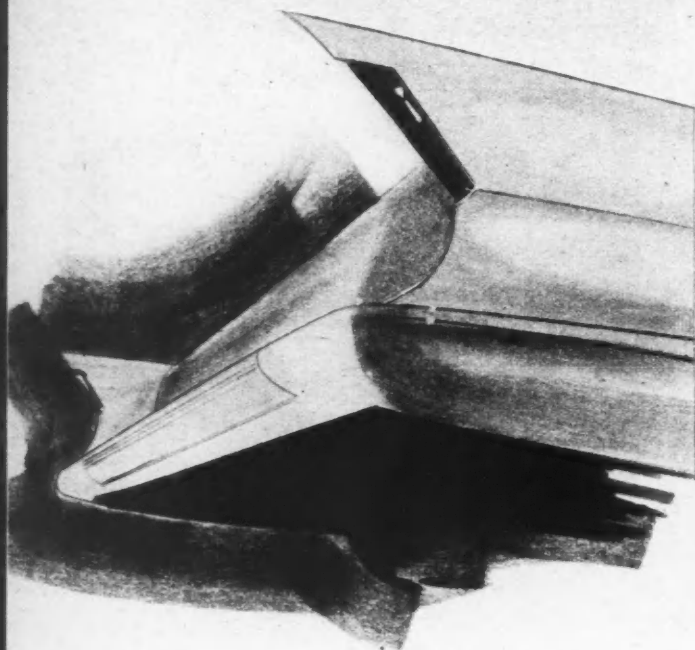
"Trend has been steadily toward candy colors," Starbird points out, "but the trend is weakening because the candy colors are difficult to apply and hard to keep up. Plenty of color will still be the key, but 'candy' is on the way out."

"The biggest '60 trend," he adds, "may well be the extension of the rear quarter panels on the front fenders into bullet shapes. The bullet shape will be big news in '60 and in the years ahead: you'll see it on Detroit cars, too."

"The plastic handmade taillight will continue and here, too, the bullet will be seen. The accessory bullet has found its mark and will see much more in 1960."







"General Motor's styling trend, started in 1959 and carried over to 1960, shows heavily accented sculptured areas. The emphasis on sculptured areas will grow in custom designs this year, too," Wilhelm says, "soon it will be the most popular design in the country. We'll see it this year on such areas as the fender panels. This is the beginning of a long design trend that could become the biggest thing in years.

"Sculptured wheel openings, such as those on the Chrysler products, will be very popular. I'm molding the fender panels in that manner this year and I've got a lot of interest in this kind of design. The nice thing is it works well on old cars or new ones — almost a universal trend.

"'60 will be a distinctive year for paint, perhaps the biggest year. We'll see sweeping trends toward radical, bright translucent paints — the candy colors, but big and bright."

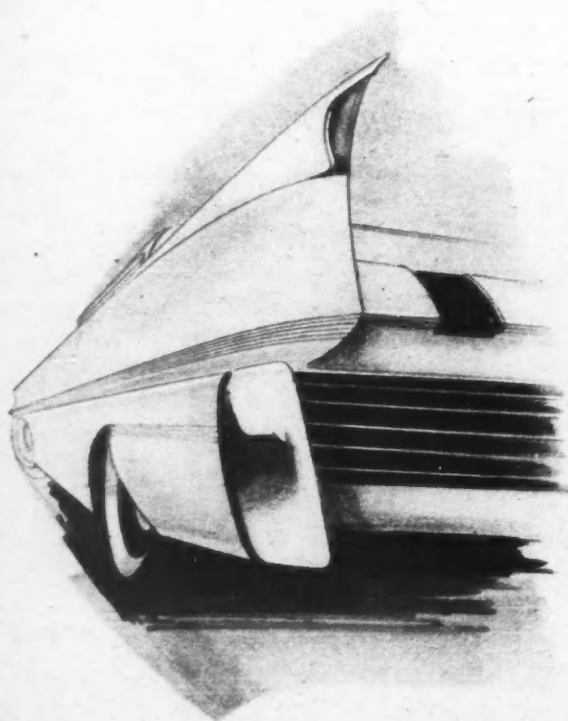
Wilhelm continued, "Scalloping and striping are on the way out and they will be less important this year than they were last year. The top colors will be red, green and purple — all in transluents.

"With the increased interest in sculptured body areas the cars will have more beauty lines and a more integrated design: we'll be able to go more and more to single colored paint jobs. There will no longer be a need for multi-hued paints, scallops or stripes to bring out the lines of a car.

"One of the biggest trends going," Wilhelm claims, "is the interest in split-level pans and in rolled belly pans. We'll see even more interest before '60 is over.

"There will be a lot of interest in the matching pan design and, luckily, the innovation can be easily and inexpensively adapted to any model make of car.

"For several years there has been a slow growing trend toward recessed license plates. This year I'm pushing hard for an inte-



## VALLEY CUSTOM:

Customizing, according to Neil Emory and Clay Jensen, of Valley Custom, is reversing itself: in early days a few car owners had a lot of work done — now a lot of car owners are having a little done. "It is heartening to see customizing take a universal trend instead of belonging to a few."

"Six headlights have begun to catch on," Neil said, "and the trend is toward bigger and bigger light designs in '60."

"A lot of car owners are changing to six lights," Jensen said, "it gives them an opportunity to re-work the grille enough to come up with a custom design for the entire front end."

"The big changes this year," Emory said, "are not outside the car, but inside where custom upholstery is experiencing its biggest year."

"In the old days," Jensen said, "the upholstery was the last thing a custom car owner thought of: today it is the first thing he thinks of."

"Custom upholstery has many advantages," Emory added, "the cost is less than the cost of metal work, and the results are more obvious. The new Detroit cars are closer to the customs we used to make, so there is less to do, but the upholstery design has not kept pace with the body advances.

"We're pulling out of the fin slump, away from the use of radical fins, and it is about time. Detroit is making the move toward conservative fins on most of its cars, the Detroit stylists found that fins don't necessarily sell cars.

"This year the Cad fins are smaller and the Cad looks better. Ford's new flare line is excellent, one customizers will follow."

## Matching front and rear pans styling favored for '60

grated recessed plate in the design. I am building a couple of cars now that will have the plate recessed into the belly pan where, I feel, it logically belongs. I look for this idea to catch on.

"There will be some renewed interest in grille designs this year. There will be some transplanting of grilles but there will also be a continuation of the custom built grille.

"The '60 Merc has a nice, straight, concave grille that can be adapted to a great variety of front end designs. It is not expensive and will be one of the top items of the year.

"We'll see a continuation of the trend toward a unified bumper and grille design, a trend that reached popularity during '59. The Chrysler design may work well into something of this nature. It will depend upon what the customizers do with it.

"There are a lot of parts from the '60 cars," Wilhelm says, "we can use on a host of earlier and contemporary models.

"When it comes to hubcaps," he says, "the '54 Dodge Lancer will continue to be the big choice.

"There will be two very popular taillight lenses this year — the Mercury and the Cadillac. The Mercury light will get a work out on a lot of cars. The Cad light, the small, curved one that fits under the fin, has less use, but there will be a rash of customizers trying to plan ways to make it work.

"Chrysler has the nicest headlight this year and the eye brow effect they achieve is a good one . . . you can use it in a lot of ways. This year it will be very difficult to use the General Motors dual lights. Most of them have been built so that you can't split them and since the trend is toward canted and slanted lights, the General Motor lights are next to useless.

"Most of the 1960 cars are low enough and sectioned enough so that the 'cleaned-up' custom will be the rule instead of the exception. The show custom will be costly and radical while the street custom will be mild and subtle."



## The big year for bumpers and upholstery

"This may well be called the big year of the bumper," Neil said. "For the first time in many, many years, more than 50 percent of the bumpers built for U.S. cars are the same width and almost the same height. It means we can interchange bumpers easier and quicker. You'll see a lot of custom car owners making big visual changes with a relatively simple bumper swap."

"The latest exhaust idea is purely a decorative one," Neil said, "and it will continue well into '60 without any let up. Today we're cutting the exhaust off, behind the rear axle then spraying it out with several tips. In many cases we use six motorcycle trumpet-type exhaust tips. The idea should catch on during the coming year."

"1960 will still be the year of wild paint," Neil added, "because many of the mild customs, with a mild paint job, just don't look like customized cars. Yet, a mild custom with a wild paint job is, obviously, a custom.

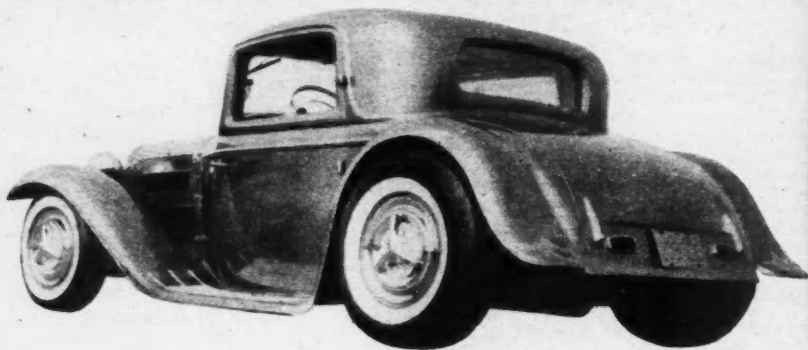
"The scallops and the crazy paint are on the way out, but the wild, custom-mixed colors are going to become more popular: the special mix colors are the answer to the man who wants his car to shout 'Custom'."

"The trend is away from older cars, toward the 'new car every year' philosophy.

"This doesn't rule out customizing — it merely rules out major custom work. Today a lot more cars sport a little custom work than they did five years ago. The new trend in customizing is toward less work more tastefully done: the customizer is ready to meet that challenge."

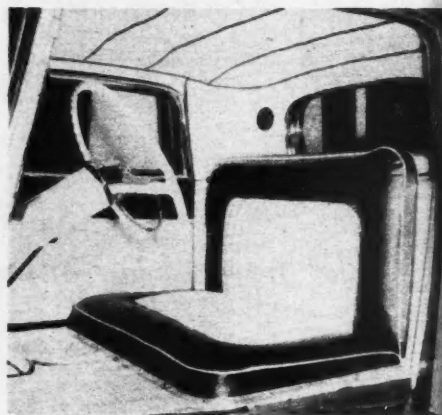
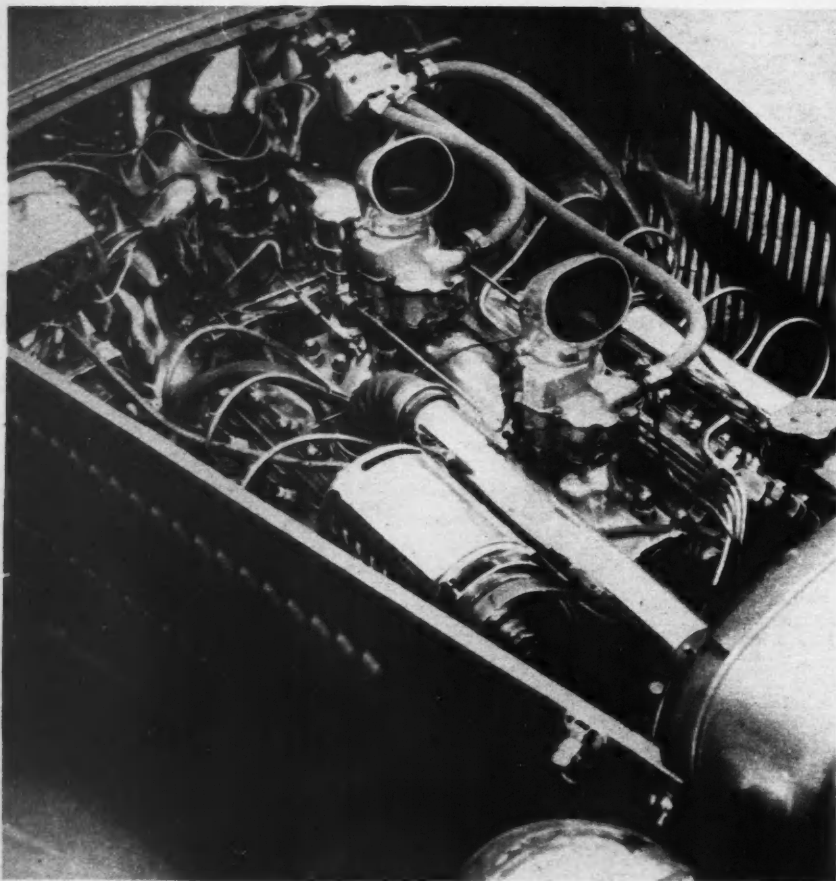


# LOW SLUNG and *Sassy*



Ross Jackson's radically lowered 3-window coupe is that one-of-a-kind rod. Externally its outstanding features are the clean sweep of the fenders and running boards that were rebuilt and molded by Doug's Auto Metal in Vancouver, B. C.

Stock displacement '48 Merc has been warmed over with Edmunds heads, Edelbrock dual manifold and Iskycam. Speed-O-Motive pistons and 1/8" larger intake valves help make coupe go. '39 trans runs Zephyr gears. Spark is H&C ignitor.

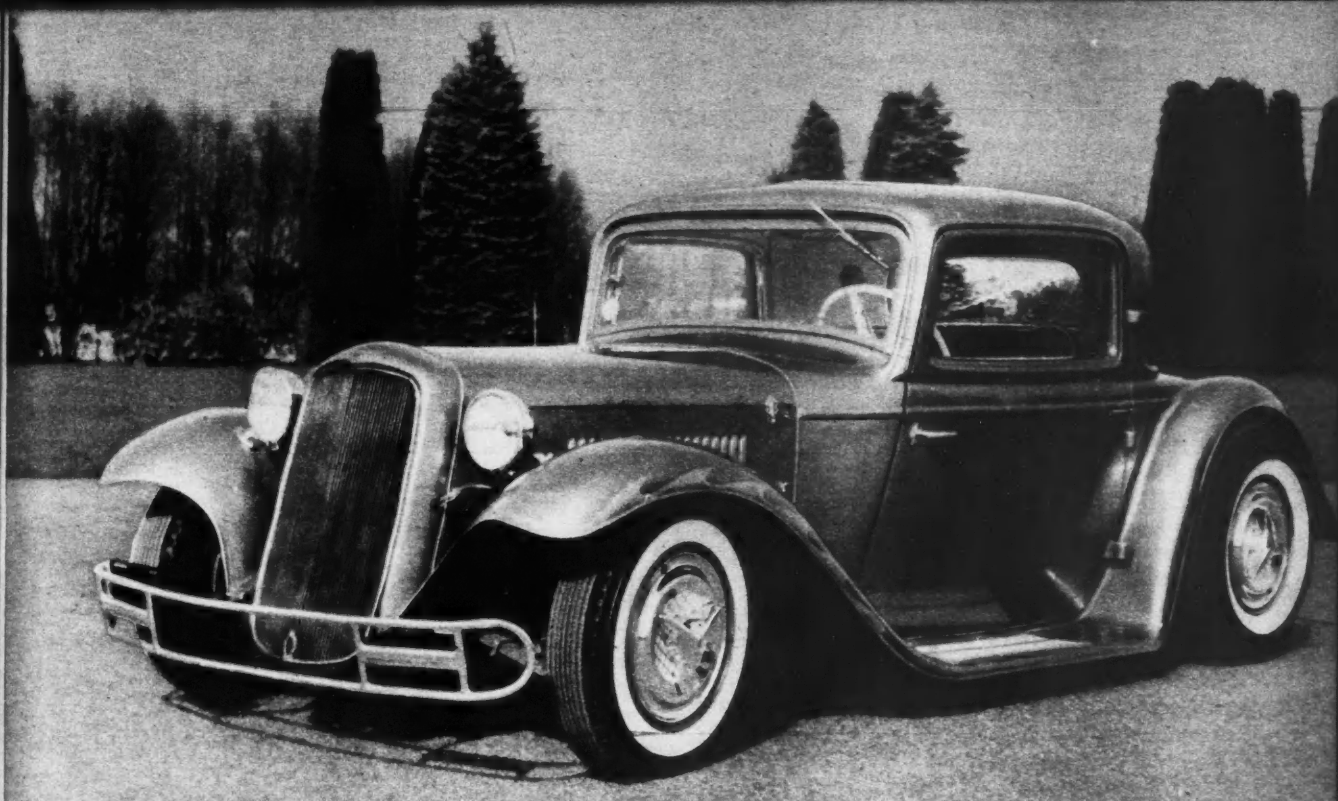


Cozy interior features handiwork of Ted Baxter, Vancouver artist, with altered seats pleated and rolled in black-white Fabrilite. Rugs are white, same as top.

Low silhouette (right) results from a 6" channel job, 7" frame kickup at rear, tube front crossmember. Jackson belongs to West Point Kustoms and B. C. Hot Rod Assn., known for fine cars. The '32 is his first attempt at building a rod.

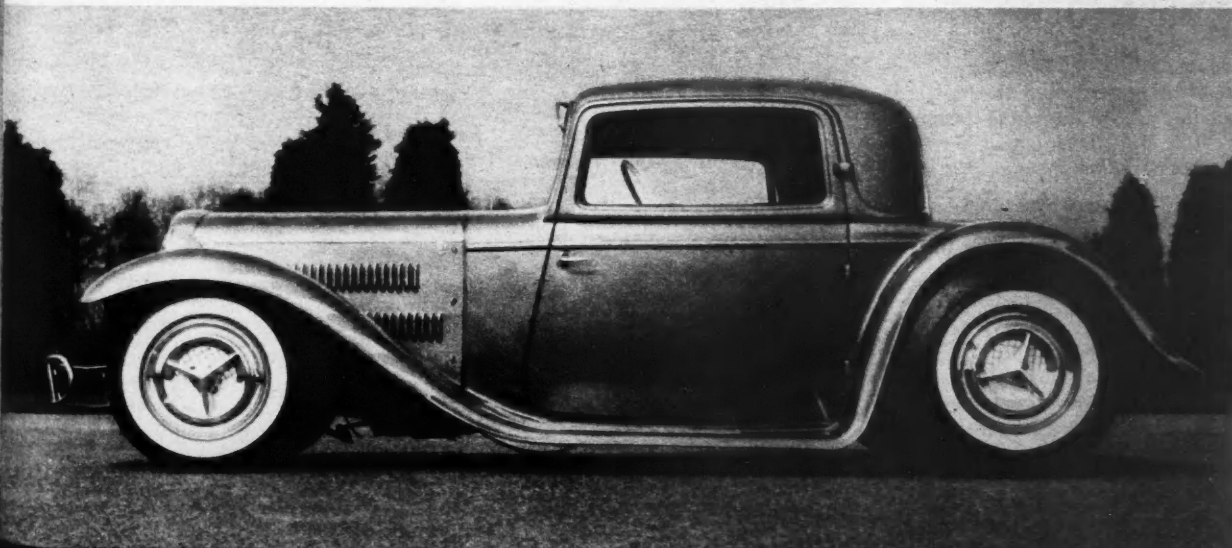
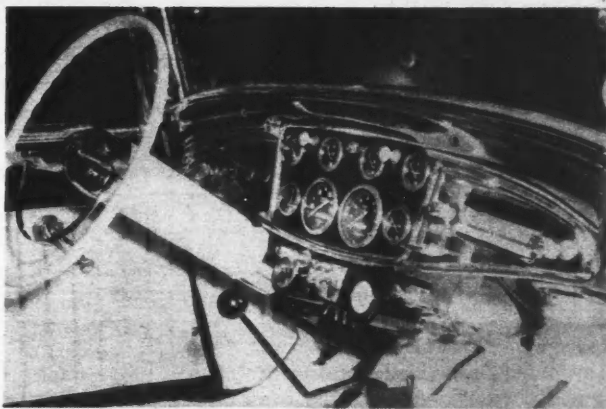
Photos by Bud Long

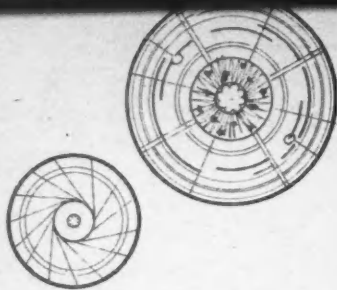




*Husky nerf bar protects sloped deuce shell, chromed headlights. Front end, brakes and steering are all from '40 Merc, '56 Chrys tube shocks cushion ride. Hood panels aluminum. Exterior graced with green.*

*Modified dash has complement of Stewart-Warner gauges including tach, radio. Steering column is also upholstered, mounts late custom wheel. Buick rims reversed on Ford centers, runs 15" white wall tires.*





by John Geraghty

SOMETIME EARLY IN the twenties when an unknown automotive enthusiast stripped the fenders from his model "T" and milled the cylinder head to achieve a little more speed—the exciting sport we know as hot rodding was conceived. Through the early years of the Rajo and Frontenac model T's, Chevrolet four-bangers, model B Rileys, Winfields, Millers, Cragars, up to the 700 and 800 horsepower engines of today the sport of hot rodding not only accomplished its original purpose of releasing creative talents of young automobile enthusiasts—but has produced many of our leading automotive engineers and designers of experimental capacity. The sport has grown from uncertain infancy to maturity where today it is embraced and supported by enthusiastic followers throughout the world.

During the growth of this rodding activity a demand for mechanical perfection has consistently necessitated progressive improvements of many engine parts and accessories. Those that would withstand the ever increasing horsepower and torque developed through powerful engine building for today's world record holders. The clutch and flywheel is one of these parts, and as a unit, has probably undergone more extensive research and development throughout this period than any other component concerning the present day *hot rod*! This fact is easily understood once one gets a clear picture of what takes place when a clutch is engaged or disengaged.

The clutch is a device which permits the power of the engine to be connected to the transmission so that the automobile may or may not move while the engine is running. The major parts that make up this assem-





# WITH A DOUBLE LIFE

*New friction materials and bonding agents improve heat dissipation in latest Schiefer competition clutch*

bly are the flywheel, clutch, pressure plate, clutch disc, transmission main drive and throwout bearing.

The main drive gear which protrudes from the front of the transmission is not connected to the engine but runs free in a pilot bearing located at the rear of the crankshaft.

The clutch plate is the "connecting link" between the engine and the transmission shaft which transmits the horsepower and torque developed by the engine to the rear wheels. When the clutch pedal is depressed the clutch disc is disengaged and the power of the engine ends at the flywheel. This is accomplished by a throwout bearing which moves forward over the transmission shaft with the multiplied mechanical pressure developed by your foot while depressing the clutch pedal. The throwout bearing rides against the lever arms connected to the spring pressure plate. These lever arms when depressed by the tension exerted by the throwout bearing draws the pressure plate away from the flywheel and releases the clutch disc and transmission shaft from engine power. Therefore the clutch disc and transmission shaft stop turning while the flywheel and pressure plate, which are bolted together, continue to revolve at engine speed. When the clutch is engaged the release of the foot pedal causes the spring tension of the pressure plate to force the friction lining of the clutch disc against the flywheel. The clutch disc begins to follow the revolutions of the flywheel. If the flywheel and clutch disc do not complete an instantaneous contact the disc will slip. This slipping will progressively decrease until they bind together and revolve as a unit. The engine power is then transmitted

through the transmission to the rear end.

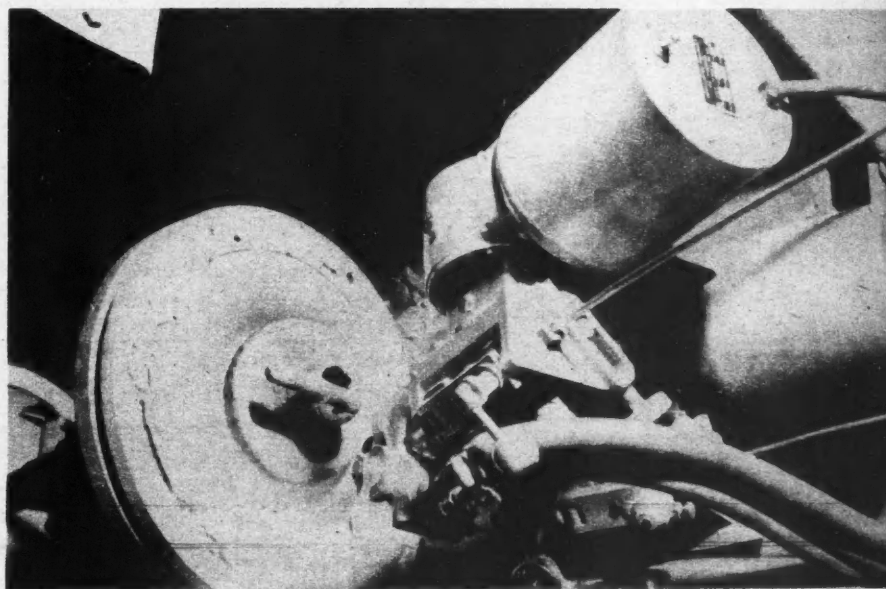
There are three major limitations involved in designing a strong, durable clutch and flywheel assembly suitable for harnessing the powerful torque and horsepower developed by today's hot engines.

The first of these limitations is the diameter of the clutch assembly. Diameter is increased to obtain more area to absorb the friction encountered when engaging the clutch disc against the flywheel and pressure plate. This diameter must be held to a minimum because of the high engine revolutions encountered with high performance engines. These high revolutions introduce a problem commonly referred to as cen-

trifugal force. Centrifugal force tends to impel the reciprocating clutch parts outward from center and introduce a dangerous chance of explosion.

The second limitation is the amount of spring tension adapted to the pressure plate. When more tension is available the clutch disc will have less tendency to slip under extreme load conditions and help preserve the clutch disc. When this tension is increased to an excess the flywheel will tend to dish or warp and the stock type pressure plate face will deflect and fatigue the metal eventually causing the face to crack and break.

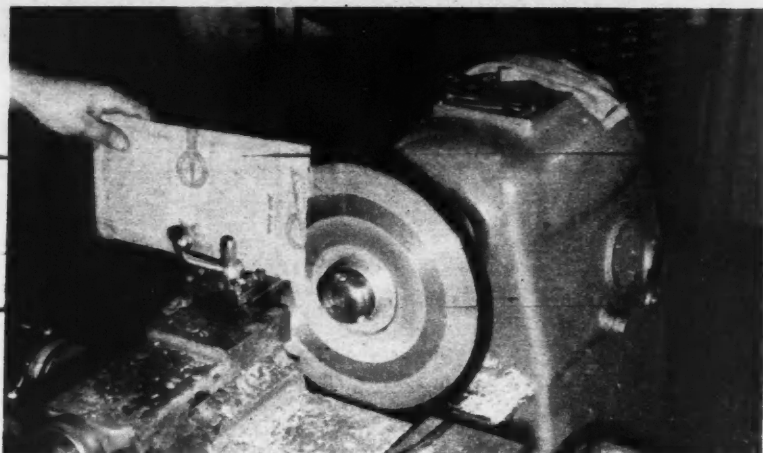
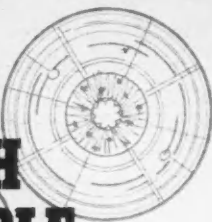
The third limitation in clutch design is the amount of frictional ma-



An exact formula of special steel and brass is sprayed into the recessed face of Schiefer aluminum flywheel. Process provides a strong, heat dissipating surface.



# DISC WITH DOUBLE LIFE



*Immediately following the metal spraying process the flywheel must be carefully faced on a lathe to produce a perfectly flat and parallel surface. Following this integral grooves will be cut into new flywheel facing to assist the heat dissipation.*

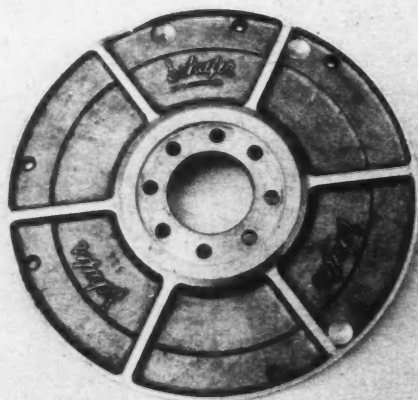
terial area allowed on the clutch disc. The size of the pressure plate limits this lining area. This is where the old fundamental physics law of friction having no bearing over area until the area is overcome by friction really applies. In other words, a disc with very little facing will hold as well as a disc with say twice as much facing until the facing of the smaller disc is overcome by friction. This is the point where excessive slippage is encountered. Higher pressure plate tensions help reduce the time required to bind the clutch disc between the pressure plate and flywheel thus reducing the slippage during engagement which causes the largest

amount of friction transfer possible.

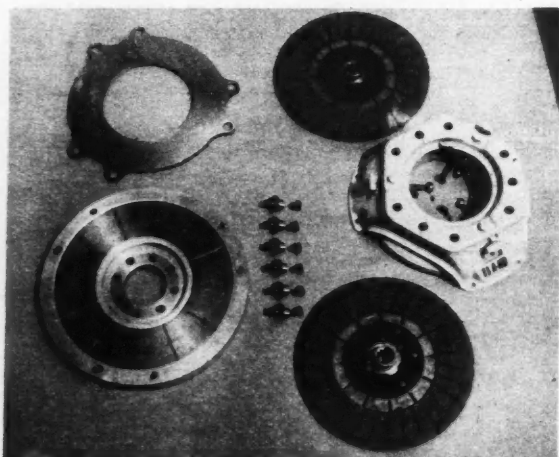
Until five or six years ago the competition clutch and flywheel assemblies consisted of a stock flywheel, disc and pressure plate—with additional spring tensions. As horsepower and torque outputs increased many of the limitations and problems previously discussed began presenting themselves. Under extreme load conditions the stock friction lining was easily ripped off the clutch disc plate. This not only caused clutch failure but oftentimes a piece of this ripped portion of friction material will wedge between the flywheel and pressure plate face. This not only causes a vibration from the out-of-

balance condition but in many cases the unequal pressure will force the plate face to crack and break. If the engine rpm is high at this point the clutch assembly will shatter and disintegrate due to the centrifugal force. Results from this type of clutch explosion will tear and shred a bell housing from an engine, proving one of the most dangerous of evils with competition cars.

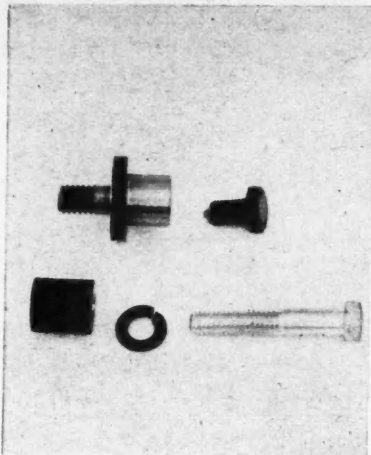
At one time a disc was produced that used rivets as well as bonding agent to secure the friction material to the clutch disc plate. A special clutch disc plate without the normal sprung hub was also used. This made the clutch disc unit a solid plate



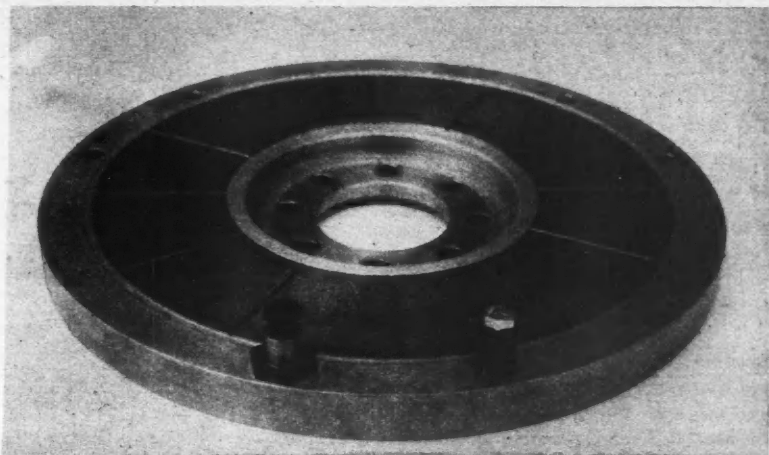
*Threaded steel sleeves are used in all Schiefer flywheels to prevent clutch mounting bolts from stripping the threads. Shouldered and knurled, these sleeves can't twist or pull out.*



*Providing twice the clutch disc area without excessive pressure plate tension is the main advantage of this competition double disc assembly. Additional surface means double life.*



*An integral driving stand with higher physical properties than 4130 chrome alloy replaces old collar and bolt stand.*



*Redesigned integral driving stand installed at left on flywheel employs a special  $\frac{5}{16}$  inch N.F. washer face cap screw with  $\frac{9}{16}$  inch head. Intermediate plate rests on the hex head of stand while pressure plate acts as a lock washer for the bolt.*

which would allow only a slight amount of disc deflection under engagement. After a very short time it was found that this special disc retained too much heat. This causes the flywheel and pressure plate faces to crack. The disc surface also cracked and became uneven. A larger disc using the full pressure plate area was prepared in the same manner. The larger area of the new clutch disc necessitated the increase of pressure per inch of surface contact. This additional pressure plate tension canceled the use of lightened stock flywheels. The reason for this was that the material removed from the flywheel caused the clutch surface to

dish and allowed the clutch disc to slip.

As the demand for more efficient clutch and flywheels became a necessity more than a desire, several of the major clutch manufacturers began experimenting with prime metals and alloys that would help dissipate the heat from the clutch disc and withstand the necessary stress encountered with high tension loads.

Paul Schiefer, manufacturer of the popular Schiefer clutch and flywheel assemblies, foresaw these problems and pioneered a special built flywheel and clutch assembly to meet these demands. Since the successful introduction of Schiefer products,

some twelve years ago, the company has been on a continuous move with experimental engineering and laboratory testing to supply current demands for powerful engine building. The Schiefer flywheel and pressure plates are machined from a special blend of prime aluminum alloys. A process developed by Schiefer Manufacturing is employed to impregnate a metal spray mixture of brass and steel into a prepared area on the clutch and flywheel facings. This metal formula reduces wear of these facings to an absolute minimum and allows rapid dissipation of heat into the aluminum which helps preserve the clutch disc. A special assembly

Photos by Pat Brallier

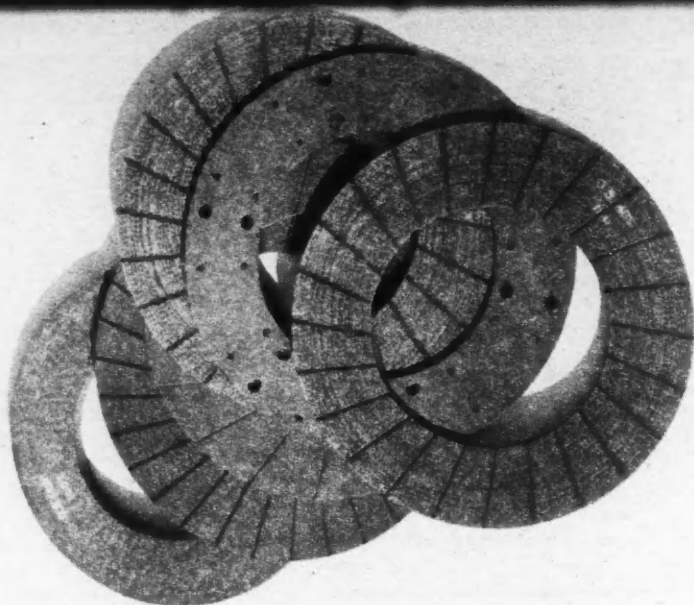
*Special intermediate plate is manufactured from class A steel, separates the two clutch discs. Ground to precision tolerances, a flat, parallel surface is assured on each side guaranteeing that both surfaces contact whole disc.*



# DISC WITH DOUBLE LIFE



*Experimentation in clutch disc material and tangential groove design led to a type of clutch disc that would furnish the most in heat dissipating qualities.*



designed for the competition machine using a single gear in drag racing is also produced by Schiefer Manufacturing. This unit incorporates two clutch discs. A flat plate machined from class "A" steel and ground to precision tolerances separates the discs and acts as an additional bonding surface.

During the last two and a half years Paul Schiefer has devoted numerous hours in different laboratories throughout the United States with many of the nation's leading engineers experimenting with various types of friction materials and types of bonding agents in an effort to remove the only weak link in any clutch assembly — the clutch disc.

At present Schiefer is introducing a newly developed clutch disc of tested and proven design. The four major parts to these clutch discs are hub, plate, friction material, and bonding agent or groups of rivets that connect the material to the plate. Each of these sections of the clutch discs are engineered for maximum performance, safety, and dependability. Two types of friction materials are produced. One for stock car and street competition, the other for extreme punishment encountered in drag racing. The material selected for street use is a special semi metallic flat sheet material with extreme shear and high burst strength. The exact properties of this material remain a Schiefer secret of quality. Various tangential groove patterns (slots in the lining faces) were experimented with to increase heat dissipa-

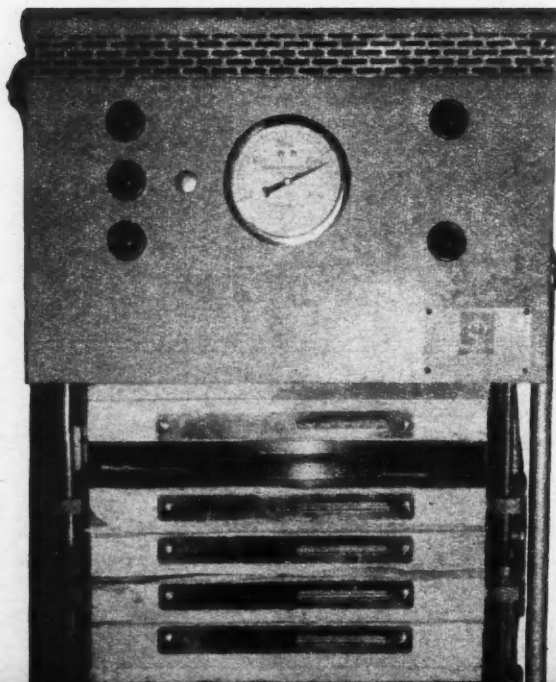
tion and allow maximum expansion and contraction of this special friction material.

A clutch disc plate was also designed for the stock car and street type competition machines. This plate features a sprung center plate manufactured from Class "A" prime spring steel and designed to absorb all torsional vibrations and transmission rattle. The sprung hub allows a progressive engagement of the clutch

which delivers the necessary smooth flow of power required for street use.

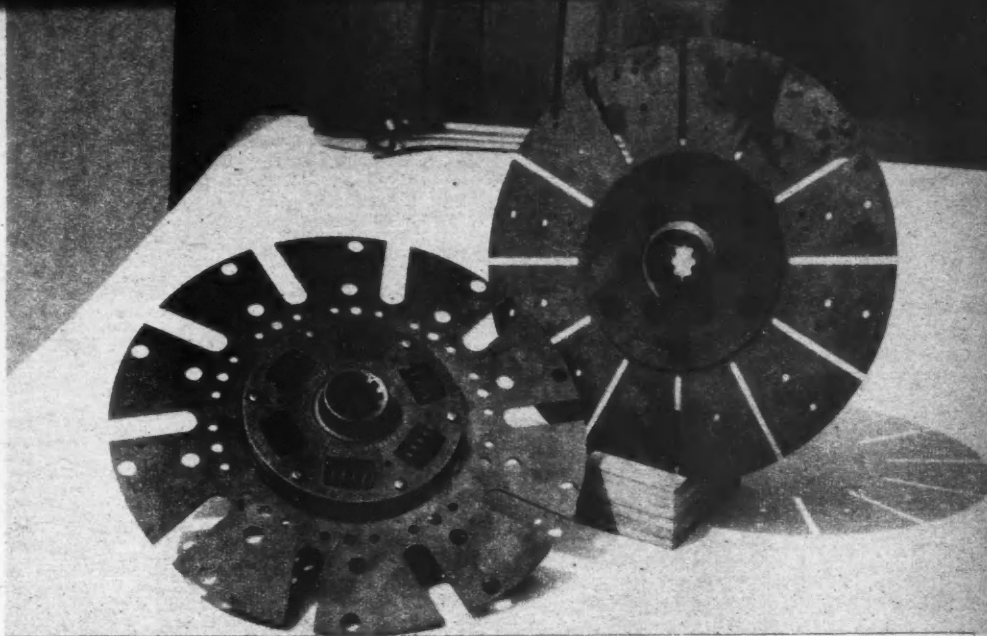
Realizing that if all surfaces of the friction material and hub plate are flat and parallel (to assure full contact of area) better heat dissipation and less distortion of the complete assembly would be experienced by bonding these pieces together. A specially formulated ductile bonding agent was discovered that would allow the necessary expansion and

*16 tons per square inch pressure guarantee that the friction materials will have a proper heat bond with the steel clutch plate. Hydraulic press is designed to keep clutch discs within a .003 inch tolerance and to assure a flat, parallel surface.*





*Two types of clutch hubs are available from Schiefer. The solid hub is designed strictly for competition, while sprung design hub provides a smooth flow of power by absorbing all trans. torsional vibrations.*



contraction between the spring steel plate and friction material encountered during heat dissipation.

After extensive research and engineering a machine was designed to exert an exact even pressure of approximately 16 tons per square inch under any desired temperature to bond the friction material and steel disc plate flat and parallel within .003 of an inch.

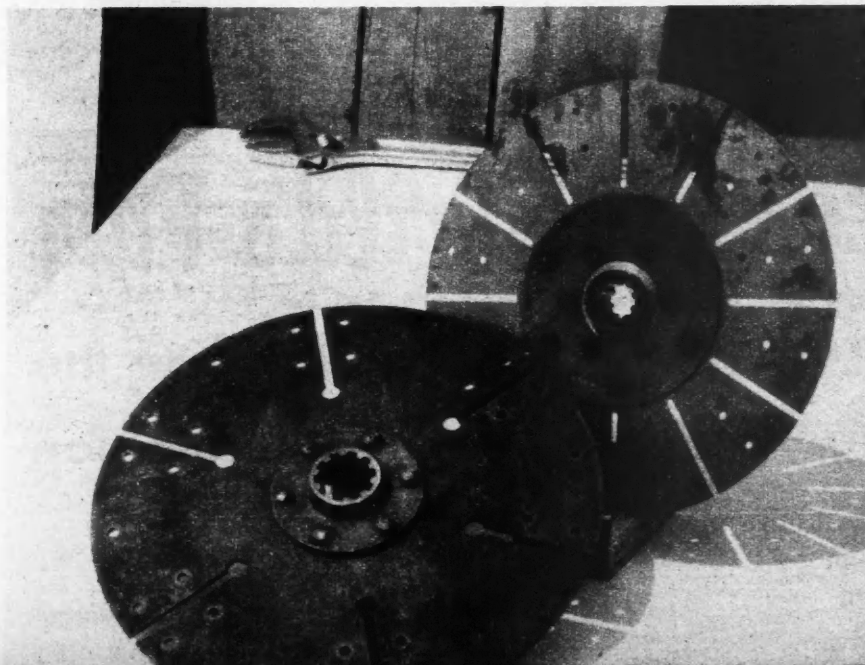
A special sintered metal is employed as the friction material in Schiefer's new clutch disc specially designed for torturous competition performance. This sintered metal is a combination of metallic and non-

metallic powdered particles united in various proportions to uniformly maintain the required coefficient of friction necessary in the clutch facings. After these powders are properly screened and mixed, a pressure of approximately 40 tons per square inch is used to cold press the powdered mixture which produces the sintered facings used on the competition disc.

The hub and plate used in this assembly are manufactured from the same materials used in the hub and plate supplied with the semi competition-street assembly discussed previously. A solid type hub assembly is

used with a double riveted lap joint pattern with a staggered pitch using special manganese steel rivets. This design reduces the direct radial stress and cancels the problem of tearing the hub from the disc plate under instantaneous engagement.

After 5000 engagements at 9 second intervals under 250 foot pounds of continuous loading the sintered disc showed absolutely no wear. The semi competition lining showed a maximum wear of only .001. This outwore the closest premium facing two to one, and registered no failure whatsoever due to the excessive heat produced during application.



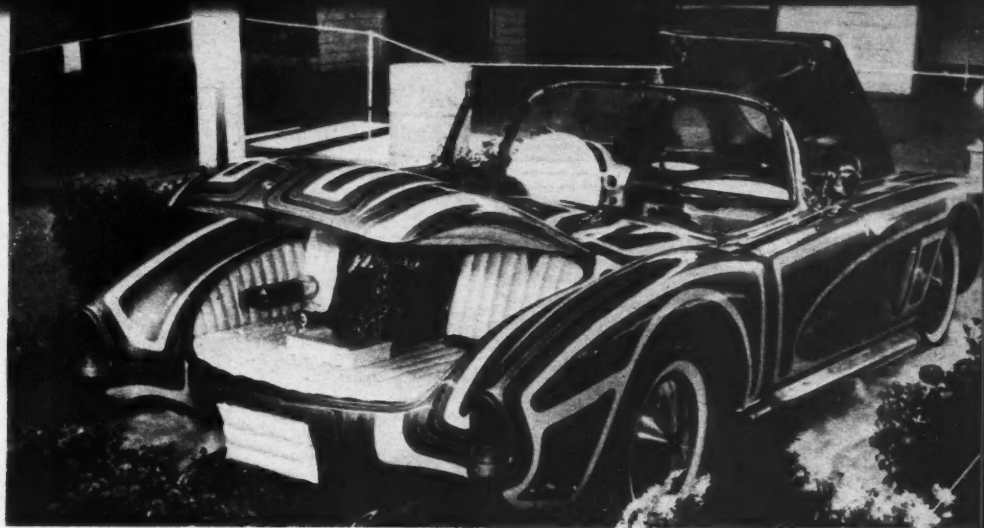
*Designed for competition, rear clutch disc features a special hub with a staggered pitch, double riveted lap joint. This special rivet pattern decreases the radial stress normally associated with a stock rivet pattern as shown here.*



# Rod & Custom World's Fair

**Top Eastern show-cars take the  
floor of second annual exhibition**

Several thousand spectators crowded the huge floor of the Industrial Arts Building in W. Springfield, Mass., for second annual World's Fair Auto Show. Scores of custom cars and rods filled the exhibition; example of fine cars shown here is this Corvette. Wildly scalloped, Leonard Menard's roadster features rolled pans, '55 Chev taillights, frenched headlights, special grille, interior glamorizing, detailing.



Photos by John Eddy

Beautifully disguised, this car is a '56 Ford owned by Peter Chiaraluce of West Haven, Ct., built by Bernardo's, Milford. Canted quads, Buick grille, rear of roof extended, '57 Ford, '56 Chev side trim.



Bernardo's Body Shop also had a rolling calling card, a GMC pickup, which has quad headlights, tube grille, top chopping, rebuilt and shaped panels and special rear grille.

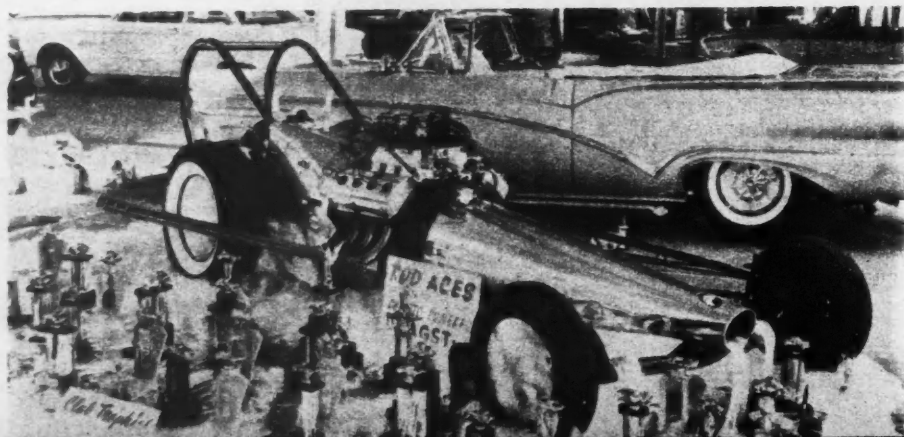




## Rod & Custom World's Fair

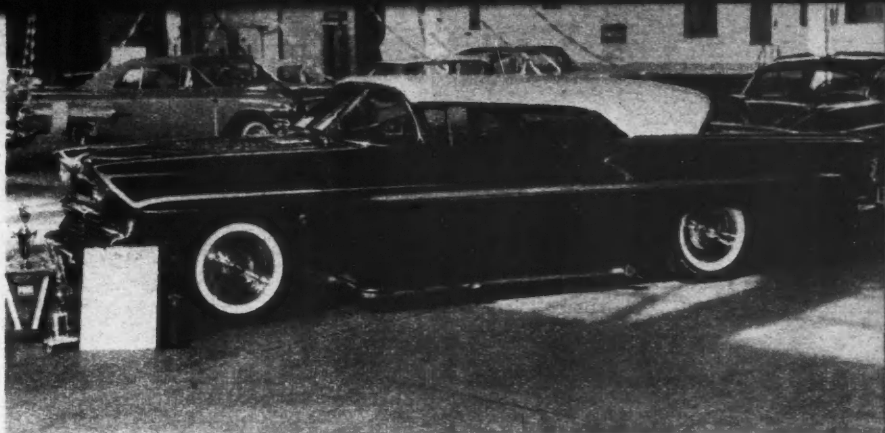
Nearly 125 of the top show cars were exhibited this year. Spectators were treated to the many varied concepts of customs and rods; an example: wild interior motif of this late model styled in a diamond-shaped 'fuzzy' material.

Awarded top prize at the show was this '54 Olds, owned and built by Tony Abato of Jersey City, N. J. The grille is Buick, with DeSoto bumper/grille bar. Lincoln quad lights, special side trim, and rear section of body is handmade.

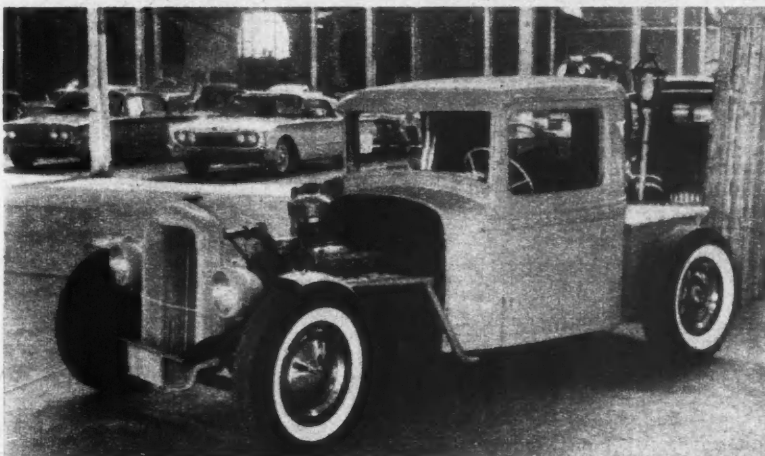


Not only were there rods and customs displayed, competition cars were also shown. Among the best was this club-sponsored dragster from Middletown, Conn., Rod Aces with 6-carbed DeSoto powerplant.

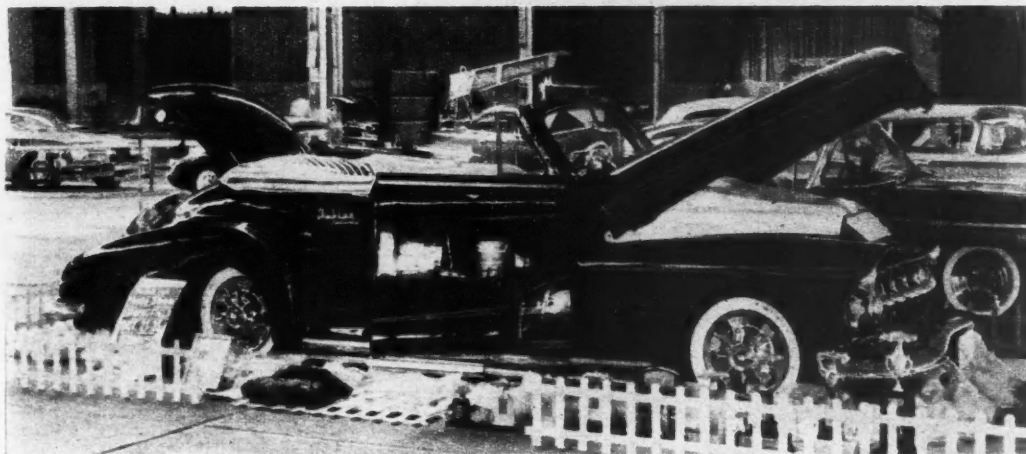
There aren't many chopped '58 Chevys around, but the 'Kandy Kart' was at the show with its tube grille, '59 Cadillac taillights, louvered hood, molded side scoop, candy red paint, padded top.



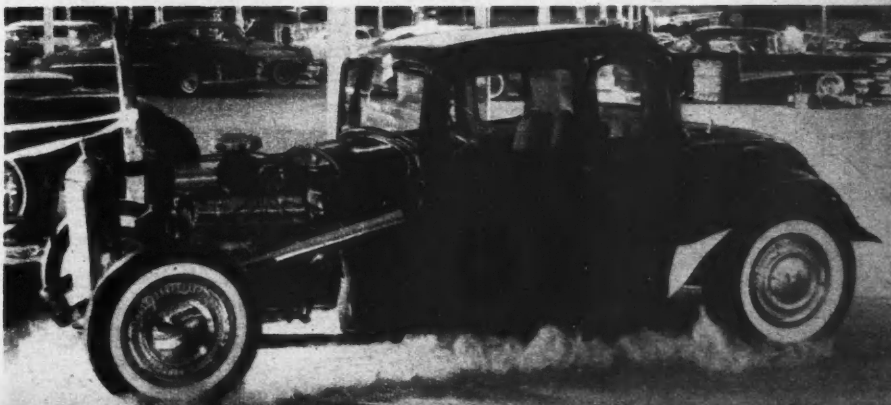
Bob Crawford exhibited his '32 Ford pickup from Salem, N. H. Channelled a few inches, truck features a 3 foot bed, '55 Mercury mill, cycle fenders, and the special details to make it a winner.



BELOW: Bob Carducci's spectacular '48 Chevrolet convert features '56 Chevy mill, trans, rear end, '50 Merc shell houses a '53 Chev grille; '55 Pontiac bumpers, Caddy headlights, extended rear fenders, Chev taillights also used.

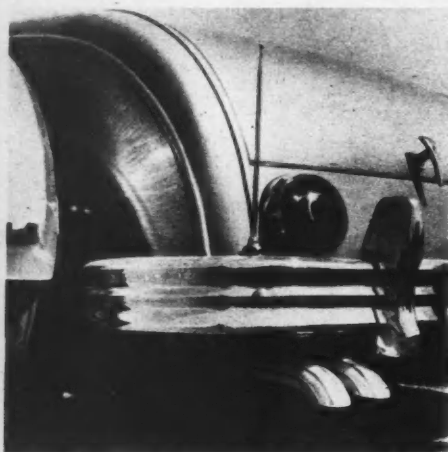


Channelled 11", Nick Kramer's '32 Ford five-window has '53 Olds engine for drive; is immaculately detailed, deuce has pleated/rolled interior, bobbed rear fenders with Pontiac taillights used.



# NEVER

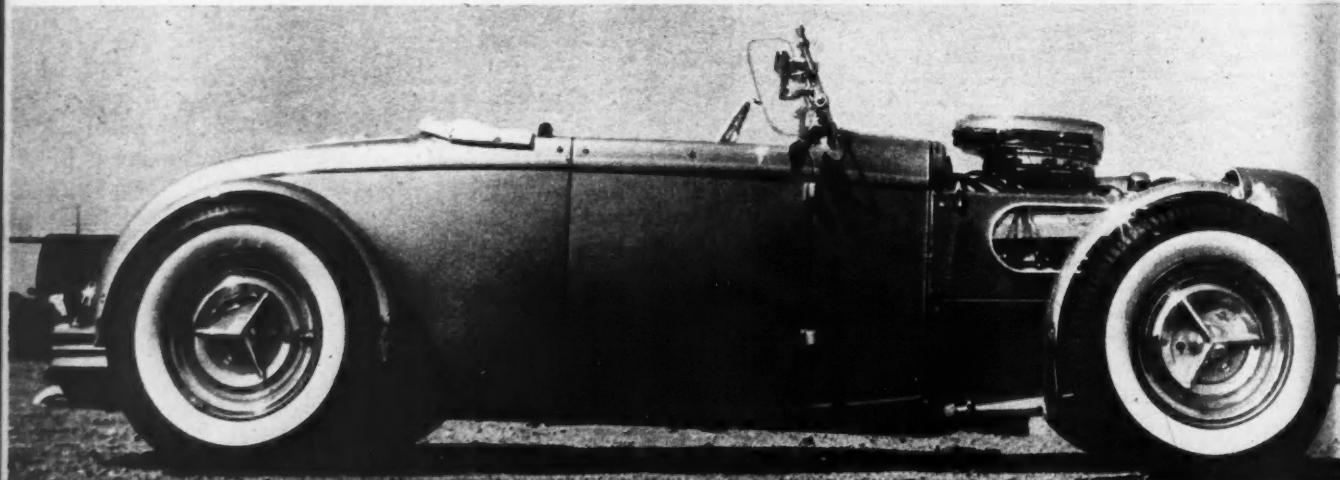
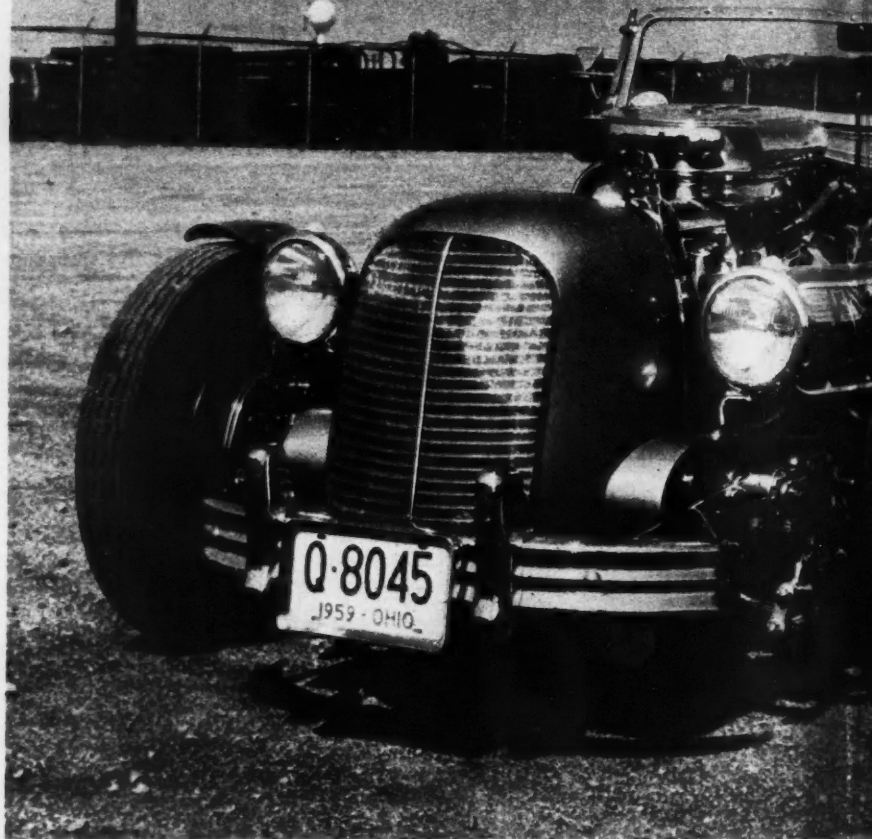
*Father / son built  
roadster cops national  
award for "Best Street Rod"*



Mounted low on rear body panel is '54 Ford taillight set. Bumper is '49 Plymouth, shortened 18". Note pipe detail.

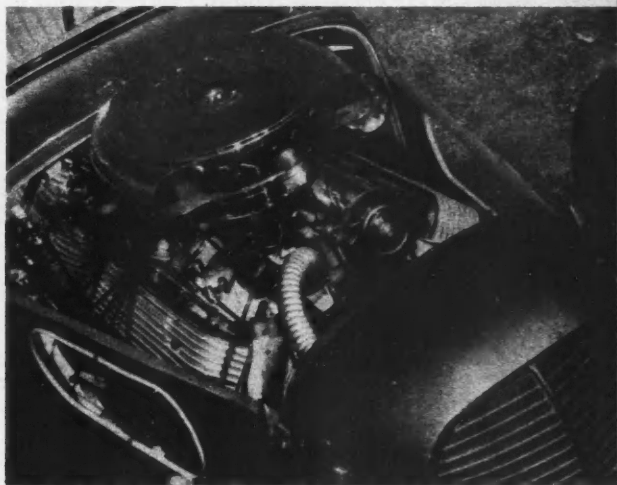
Carl Cross and family of Marion, Ohio, built this fine '32 Ford roadster. The grille is a reworked '36 Ford truck assembly, while bumper is '49 Plymouth. Chromed fenders are boat trailer units.

Low ground silhouette is due mainly to 7 1/2" channel job. Windshield chopped, and plexiglass wings added. To add to sparkling chrome parts, 22 coats of Burgundy Mist lacquer are applied.

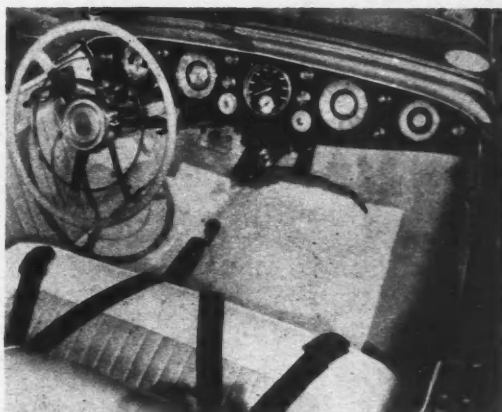




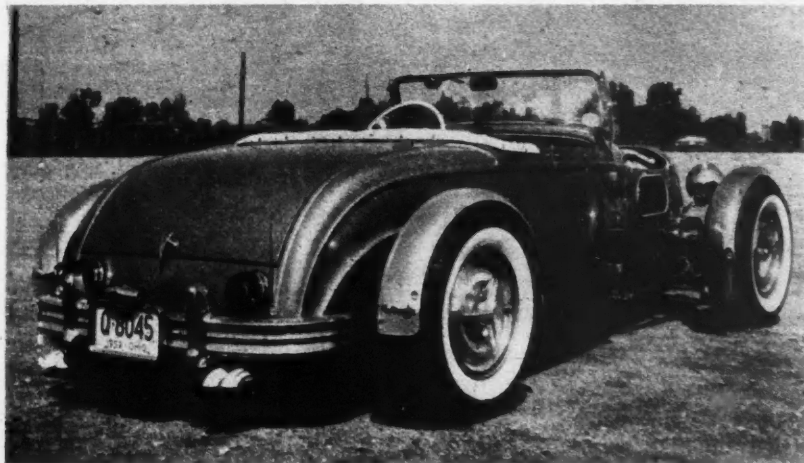
# TOO OLD



Motivational power for Cross' rod is '53 Olds mill with Mallory ignition, 4-barrel carb and stock dimensions coupled to a Hydramatic. '48 Ford, '49 Merc brakes.



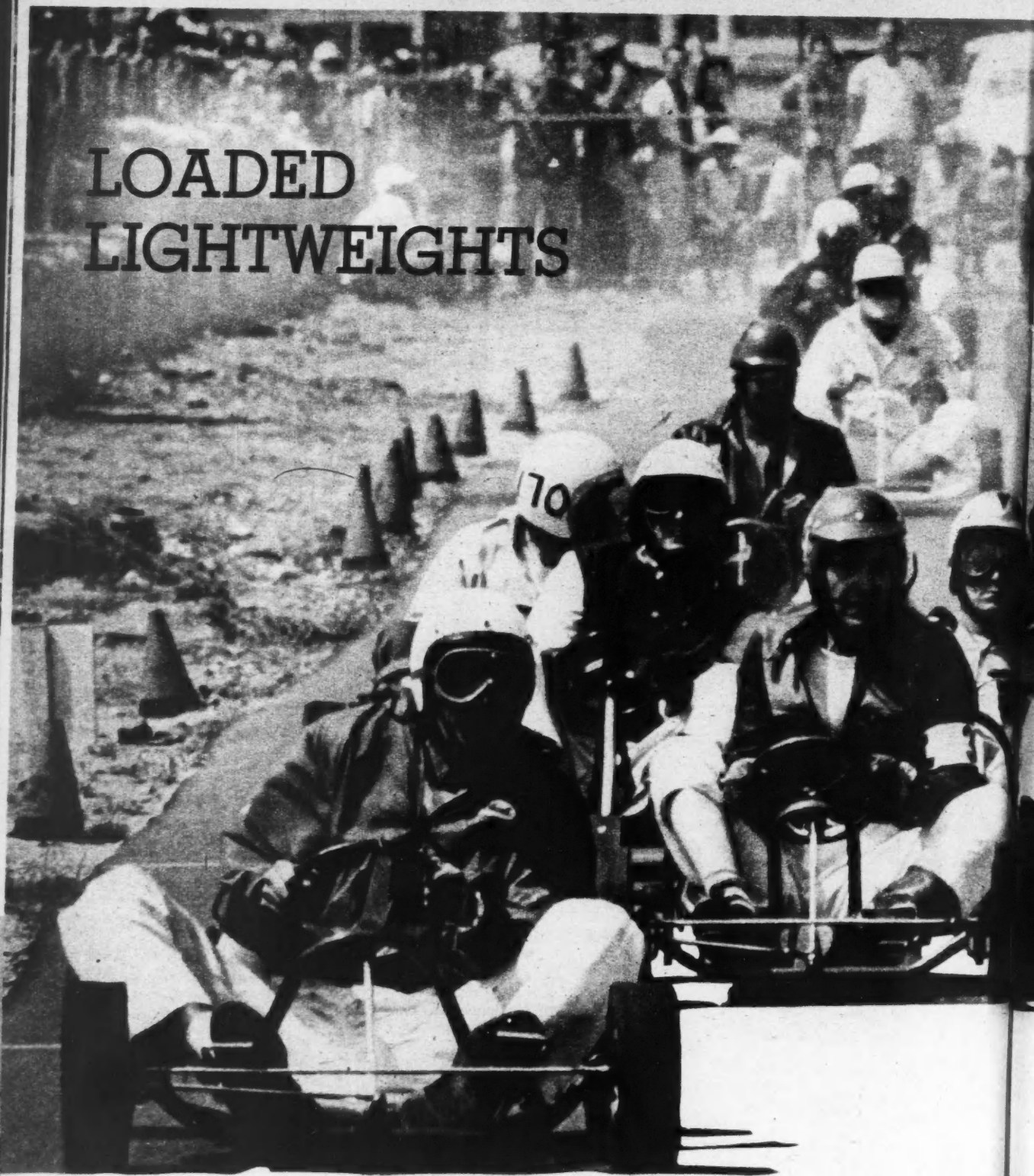
Photos by Pat Brallier

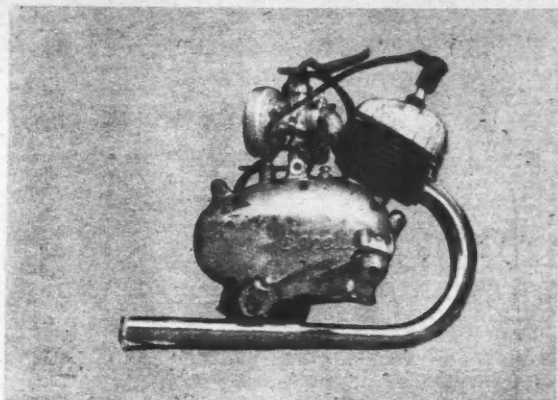


Steering wheel is '46 Buick, as are gauges, save for S-W tach. Pink and white Naugahyde is upholstered by Smith Top Shop in Columbus, Ohio. Rug is white with pink trim.

Suspension is leaf springs up front, '50 Olds coil springs in rear. A 3-inch dropped axle is used with a stock '49 Merc rear end. Steering gear is a Graham and Ross assembly.

# LOADED LIGHTWEIGHTS





Italian Benelli motorbike engine winds up to 7000 rpm on 3.6 HP, displaces 50cc (3.05 cu. in.) Runs in class "A" Super under GKCA rules, features clutch, trans, lite-weight.

## *Motorcycle Engines—Are they Kart racing's answer to tight corners and long straights?*

By Bud Lang

HOW MUCH POTENTIAL lies hidden in the many small foreign two-stroke motorcycle engines that meet class displacement qualifications for kart racing? The answer to this question is evident as more and more competition minded karters currently swing to these potent imports, which in many areas are setting quite a rapid pace for fellow competitors. The small, but powerful lightweight bike engines come in the form of Villiers, England's renowned motorcycle engine, Yamaha, Japan's latest import of performance notoriety, Maico and Zundapp, Germany's long established two-stroke bike engines, Lambretta from Italy, Excelsior, Puch, and many others.

One of the main advantages in owning a motorcycle engine powered kart is that these two strokes in most cases have a far wider torque range over any industrial engine that has been designed to run at a constant rpm. Horsepower alone doesn't make a winning engine, having been proven time and again, on a race track that possesses tight corners and short straights. Any engine capable of giving a respectable amount of horsepower along with lots of torque at variable speeds or rpm's has a good chance of driving you to victory. This is where the motorcycle engines importance makes itself felt.



## LOADED LIGHTWEIGHTS



Through years of factory experimentation and testing on race courses throughout the world, these two-stroke motorcycle engines have been highly developed to give outstanding performance without sacrificing engine longevity. These race-bred qualities are what make them stand out in the field of karting. Motorcycle engines come stock from the factory with lower ends designed to withstand punishment from higher compressions, hotter fuel and additional

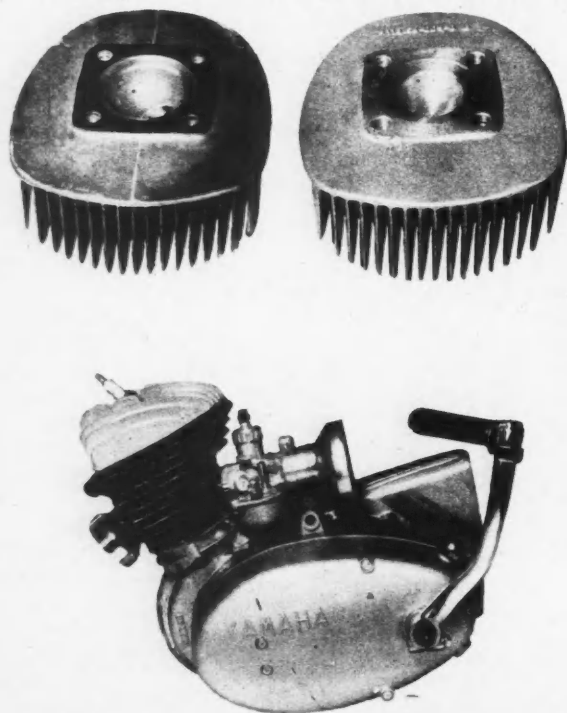
rpm's that the engineers know will be squeezed from them once in competition.

One such engine is a 15 cubic inch Zundapp that has been raced continuously for the past year and one-half in all rugged types of motorcycle competition here on the West Coast. The engine runs gas or fuel, its rpm nearly doubled, turning 10,000 while hitting the century mark at times, the crank and rod bearings have never been replaced

nor the crank itself. This sort of performance is scarce when it comes to engines designed for commercial and industrial employment.

On the subject of torque ranges, it should be pointed out that since many motorcycle engines are used in racing competition, all having transmissions, these engines must be capable of providing sufficient power and torque at any speed, whether it be 5 mph or 100 mph. On the other hand an industrial engine is designed

*Maico provides a real variety of compression ratios for their 175cc & 250cc engines thru assortment of heads and gaskets. Stock head (left) gives 7.2:1 c.r. on 250's, 8.8:1 on 175cc engine. 11:1 model on right. Scrambler heads, 9:1.*



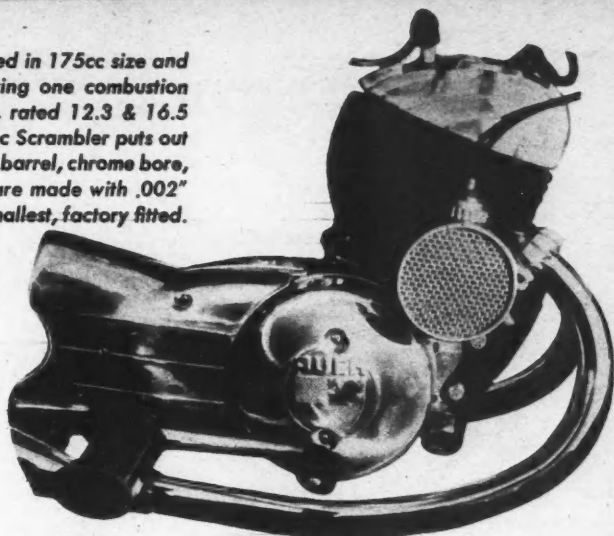
No room to spare is one sacrifice of the "big bore" engines. 15 inch Yamaha twin puts out 28-30 HP, double stock rating, thru extensive tuning, modifying. RPM jumped from 6000 to 9000, evidence of potential in these engines. A smaller partner of the twin, not silent however, is the 125cc (7.6 cu. in.) single, rated at 6.8 HP at 6000 rpm, with 15 HP, 9500 avail.

CAR CRAFT



*Much modified Zundapp piston has crown notched to advance timing. Skirt shortended 'til desired timing on intake & exhaust was achieved, aids gas flow.*

*The Puch, right, is offered in 175cc size and in a 250cc twin featuring one combustion chamber. Austrian duo, rated 12.3 & 16.5 HP respectively. A 250cc Scrambler puts out 21 HP, has an aluminum barrel, chrome bore, twin carbs. 11 pistons are made with .002" between biggest and smallest, factory fitted.*



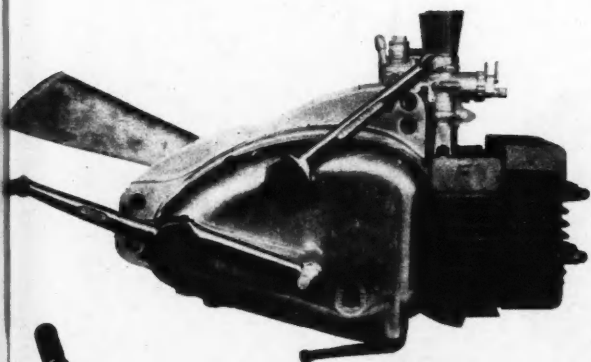
to produce a certain amount of horsepower and torque at a given rpm to do its job well. In the past, and to date for sure, the industrial and chainsaw engines have given splendid service to thousands of karters. No doubt about it, their founders never believed they would see the day when these potent little powerplants would be burning fuel and rubber on race courses of the world.

But facts must be faced squarely. When an industrial engine that is

capable of say 6000 rpm goes into a tight corner, and the revs drop off to 3000, unless the driver is capable of keeping his foot in it, retaining the rpm, the engine will have to strain for some distance before regaining enough rpm's to climb back to horsepower level. Rpm lost in the tight cornering results in a tremendous loss of torque, causing the engine to bog down. On the other hand, a similar motorcycle engine with a high of 6000 rpm, can fall back to 2500 or

2000 rpm in the same gear and still move out rapidly when the throttle is applied. However, any engine that has been designed to run at high rpm, be it motorcycle or industrial, will sacrifice torque in the low rpm ranges. Still this sacrifice will not be as great with many of the motorcycle engines available today that are suitable for kart racing.

With all the performance features such as horsepower and torque that the majority of motorcycle engines



*Rumi 125cc engine, left, is a precision piece of Italian workmanship. Mounted horizontally for low profile, Rumi uses twin pistons with high "U" shaped crown, a departure from standard. Twin carbs help 7.6 inch turn up 10,000 RPM.*

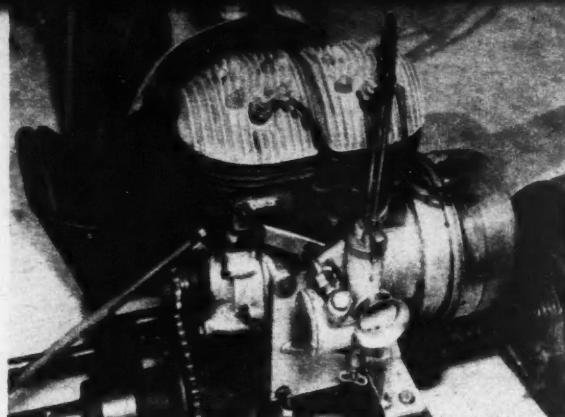
Below are two Japanese Yamaha 250cc (15 cu. in.) twins, one complete engine with trans, one with trans removed by surgery to save weight and HP loss by gearing. Aluminum mounts have been welded to the shortened case that is setting on a kart frame for size comparison. This modification plus the inches available, make the Yamaha a very hot candidate for karting. Special head is available while crank is of 360° counterweight design, best for two-stroke efficiency.



CONTINUED



## LOADED LIGHTWEIGHTS



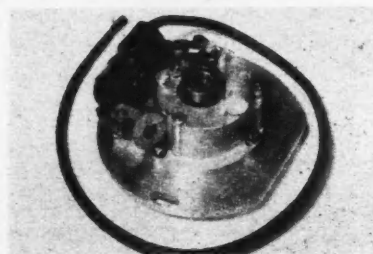
Excelsior 250cc twin (15 inch) engine powers this kart, one of the west's oldest, giving excellent performance with little maintenance. Has roller bearing crank, rated at 14.5 HP.

Aluminum 15 in. conversion kit at left is from English firm of Pearson, consists of barrel, piston and head. Offers more inches, better cooling, saving in weight to the 197cc (12 cu. in.) Villiers, Lambretta and BSA. Complete cost is \$90.

Hot Italian import (below left) 125cc (7.6 cu. in.) Aermacchi, putting out 7.5 HP at 7500 rpm stock. The transmission can be removed easily, saving weight and power loss, making up for the 4 inches it gives up to class "B" karting regulations.

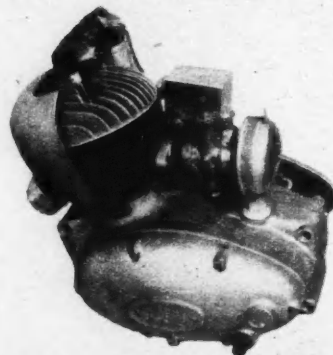
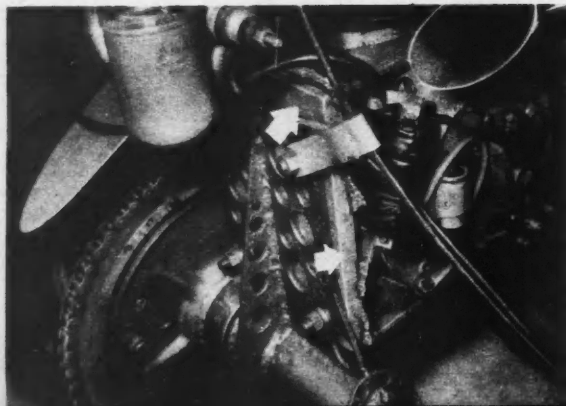


Closeup of engine installation on kart illustrates method of adapting unit-constructed cycle engine minus transmission. This German Maico 15 in. engine has the trans. cut off, one half in. aluminum stock heliarced to rear for new mounting.

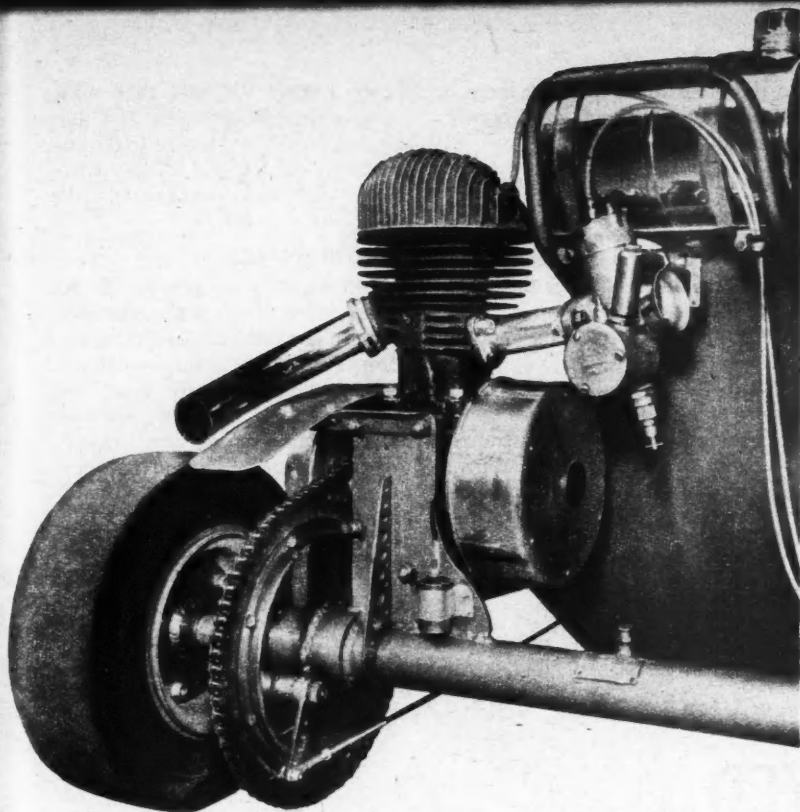


Joe Hunt magneto is available for all two stroke motorcycle engines, offering a hotter spark than battery ignitions, especially at the higher rpm's. This setup is for the Zundapp. Cost \$52.50.

Austrian Rotax, below, displaces 125cc (7.6 cu. in.) as a "B" Super entry, gives 7.5 HP at 7500 rpm. Unique feature is fan on far side that blows air over cylinder via aluminum shroud, driving off crank. Removal of transmission will halve weight.

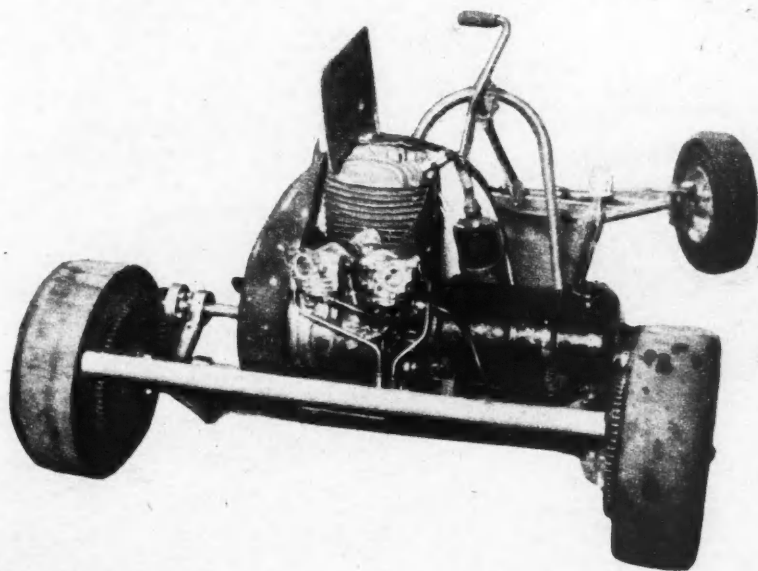






English Villiers are readily available in U. S., come in 6 displacement sizes. This clean installation is a 197cc (12 in.) that has been sleeved down to about 11.2 inches to make class "B" limits. Trans is removed by four bolts, allowing simple hookup of engine to mount. Speed equip. abundant, making Villiers good choice.

Not so gentle kart is Lambretta scooter powered, tame engine offers a lot. Runs with no trans, has mag, pistons are cam ground (oval) for racing. Many speed parts are available, hop-up possibilities unlimited.



supply, most fall down in one respect. That is the weight category, which is all important with kart racing. Nearly all two-stroke motorcycle engines are currently designed and built in a unit-construction fashion. That is to say that the engine crankcase and the transmission case are integral, one casting. With the transmission included this ups the purchase price of course, but of more importance is the space it requires at the rear of any kart regarding adaptation.

Since regulations in most American karting associations do not permit a change of gear or sprocket ratios while the vehicle is in motion, two alternatives are placed in the owner's lap if he should own an engine-transmission unit. He can leave the transmission as is, possibly removing only the gears from the case for less friction and drag. The second choice is one that many bike-kart enthusiasts are turning to in this early stage of lightweight installations. The rear portion of the integral casing is cut away leaving only the engine casework. Engine mounts are then welded to the remaining crankcase. This is a job that should be performed by an experienced machine shop and one that is capable of quality aluminum welding.

Villiers, Lambretta, Aermacchi and Excelsior are among the few two-strokes available with detachable transmissions. This means a saving of weight, money and relief from horsepower loss by running through a transmission. Vehicle weight has tremendous bearing on acceleration especially with lightweight small engine powered karts, and where a substantial saving can be made in this department without sacrificing strength and safety, a kart should really move if powered by the proper engine. One more sacrifice motorcycle engines must make when adapted to kart competition is cubic inches, which you might say they give up quite generously.

As initially established, GKCA displacement classes were designed and worked up around the industrial and chainsaw engines adopted for karting. As compared to most motorcycle engines which are more or less manufactured universally to specific sizes, the variety of chainsaw engines first adopted to karts were all in the five inch bracket. Therefore when maxi-

OF ALL THE PSEUDO-sports car style cars to emerge from Detroit's famed drawing boards, perhaps the '53 Studebaker designed by Raymond Lowry is the sleekest. Many already consider the Stude as a classic in American automotive design. This, in itself, makes the Studebaker a natural for our restyling torch.

This month, we've handed the chore to our regular illustrator for this department, Larry Evans. A student of the famed Art Center School in Los Angeles, Larry not only can draw cars, he knows them inside and out due to his past hot rod and custom car experience. Keeping within

the thousand dollar bracket, here is his rendition of the updated classic.

#### BODY MODIFICATIONS

Though the Stude shell is about as unembellished with chrome trim as any car to come from Detroit, it still has a few trim items; these are removed and holes filled in the traditional custom manner.

On the next page, we have an alternate view of the restyled car, which shows the Stude minus the '58 Thunderbird side panels and pipes which are included on the main illustration. The alternate also features a flat hood panel rather than the stock Studebaker hood used on the custom

shown below. We feel that these, along with the spotlights and door handles, are optional items to the customizer, depending upon which theme—custom or semi-competition—he desires to follow.

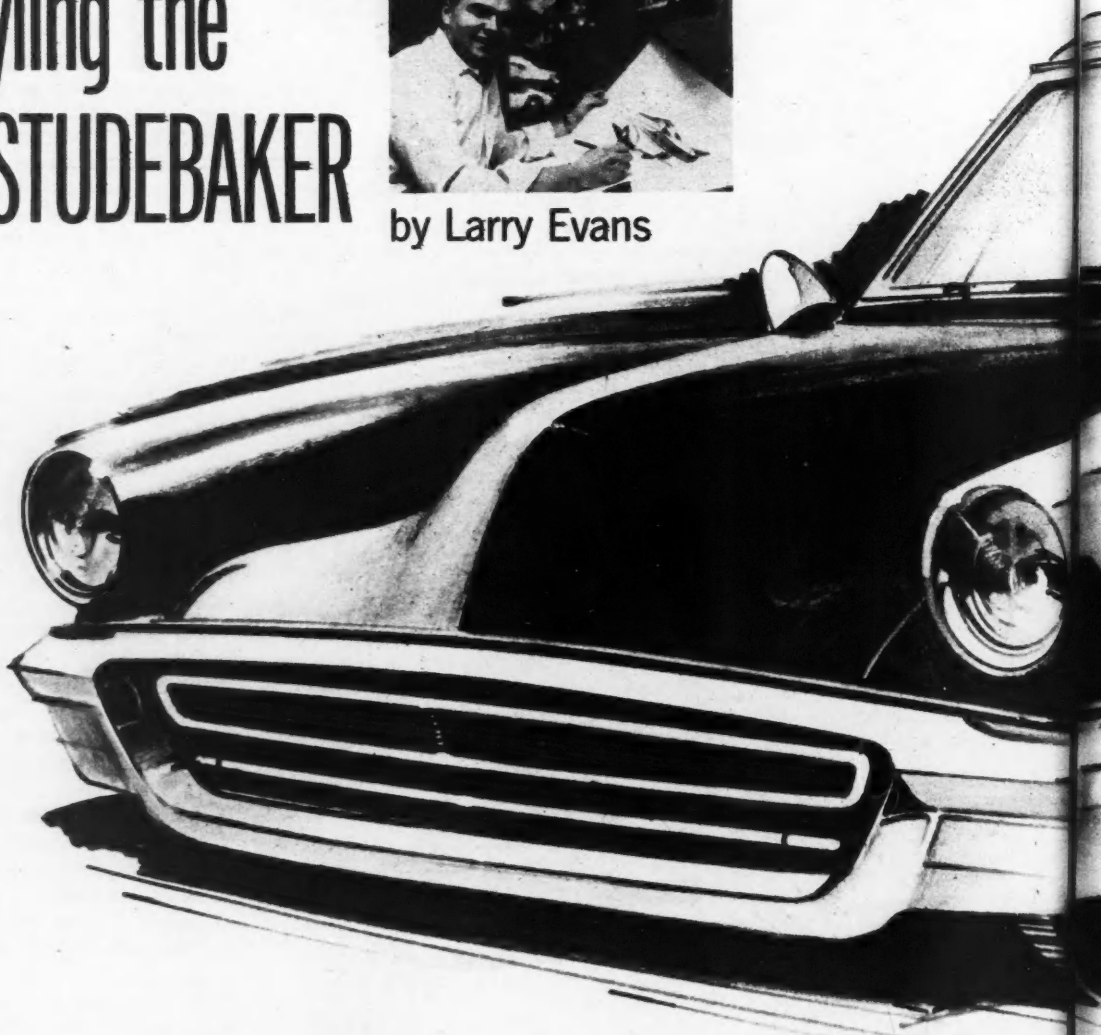
#### FRONTAL CHANGES

Most striking change to the forward portion of the body is the substitution of a '58 Thunderbird grille/bumper assembly. This is sectioned and trimmed to fit the front end. We've removed the stock 'Bird circular chrome screen and added a tubular bar grille carried out in an oblong oval shape on the top with a straight bar below. On the tips of

## Restyling the '53 STUDEBAKER



by Larry Evans



the lower straight bar, are plastic ends which are reworked to serve as turn indicator lamps.

The headlights are frenched to the fenders with deep-dish type rims, similar to the early Continentals. As we pointed out, either the flat hood or the stock peaked hood could be used. If you're switching engines (a late Corvette would be fine) you might find this a factor in choice.

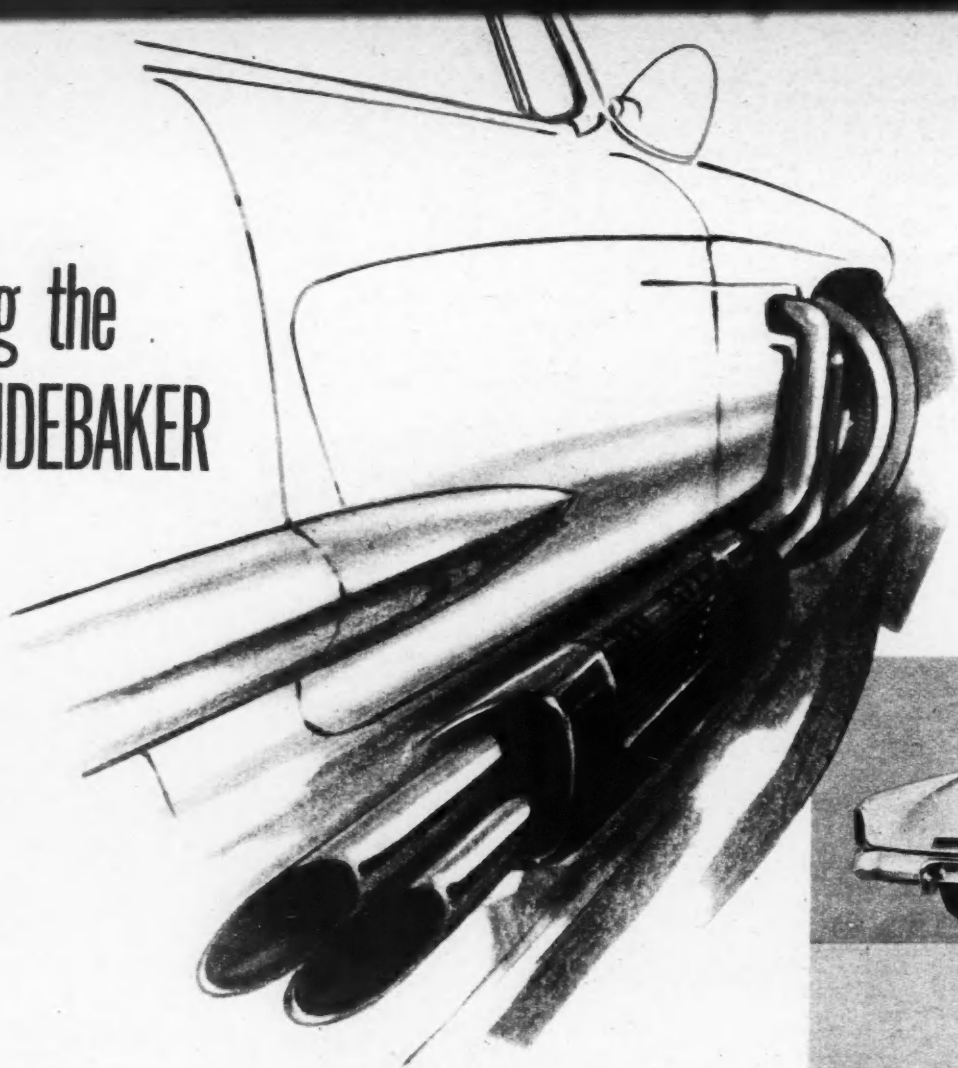
#### REAR ASPECT

Fenders are reworked at the rear to contain '57 Chevrolet taillight lenses. On the top ridge of the fender panel, Stude mounts a chrome trim piece. This was not removed in





# Restyling the '53 STUDEBAKER



the dechroming process as it is now used for a base to install dual antennas which are horizontal.

For rear protection, Evans chose to install a '57 Thunderbird rear bumper. The tips of the Bird bumper are used for back-up lights, replacing the exhaust tips which now are mounted on the side, or protrude from beneath the rolled rear pan. In the center of the pan is a recessed license mount. The trunk is dechromed and operated either with a solenoid or by pull-latch mechanism.

#### DETAILS

Much thought has been given to

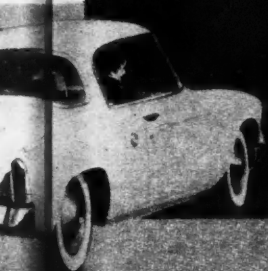
the small details which always add so much to a car. The side exhaust system is one of these details. It is composed of two pipes which carry the exhaust gases from the engine through the sides of the car into dual mufflers which are covered by chromed heat guards. The tips are curved away to protect the car's lacquer finish. Hubcaps are new Dodge Lancer discs; these were chosen because of their unusual appearance and competition-type theme. Dual spotlights can be added if you desire more of a boulevard custom effect. The '58 Thunderbird flare panel

mounted on the sides from the center of the door rearward can be used. These are simply and easily molded to the sides. You'll notice that the illustration with the 'Bird panels tends to shorten the car's appearance. This breakup in length should be considered when choice is made.

All in all, Larry Evans' restyle of the '53 Studebaker ranks with the best. There is, theoretically, unlimited changes in design and features that can be made to this version of the Stude, which, add up to making it foundation material for versatile customizing.

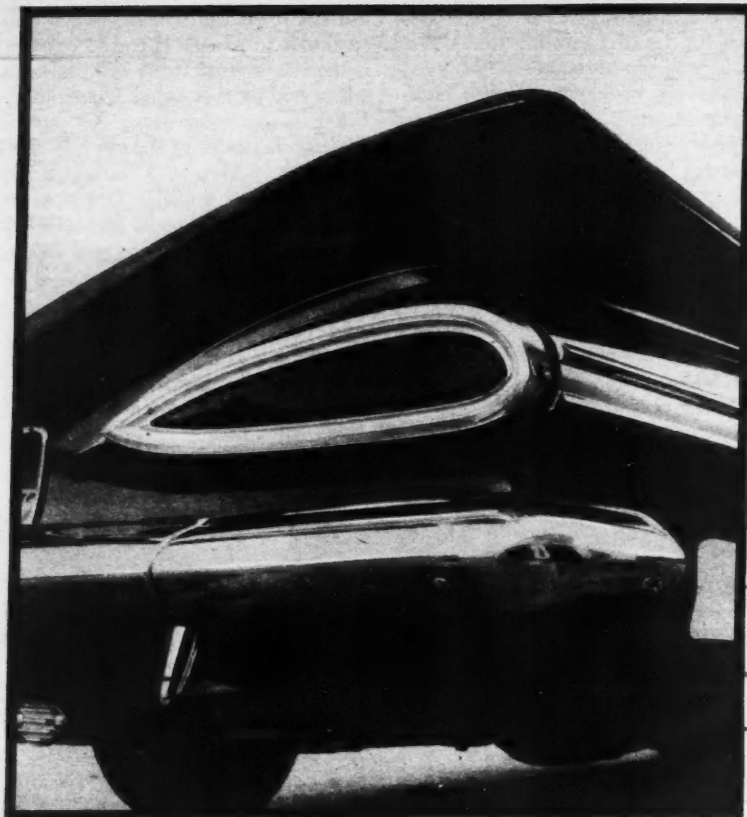
#### PRICE LIST

	Pump, Labor included		
French headlights	\$ 75.00	Roll rear pan	60.00
Adapt and construct grille	200.00	Install dual antennas	25.00
Construct side exhausts	175.00	Mold T-Bird side panels	100.00
Rework hood and trunk	25.00	Lowering (3-inches)	50.00
Install taillights	50.00	Paint (lacquer)	175.00
Adapt rear bumper	50.00	<b>TOTAL</b>	<b>\$985.00</b>



# here's how:

inexpensive plastic  
lenses for '59  
chevrolets—a new  
bolt-on accessory  
for custom  
appearance  
that can be  
plain or fancy



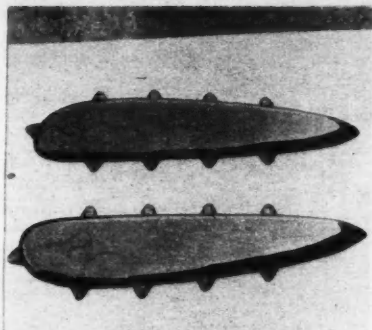
PLAIN OR FANCY—take your choice. Rapidly growing in popularity is the accessory replacement taillight lens constructed of plastic. There are many that the customizer may choose from, depending only upon his taste in lenses and make, model, automobile. Reasonably priced, they allow the thrifty restyler an opportunity to change the taillight's appearance without going into a great deal of metal work. The '59 Chevrolet 'Flattop' lenses used here, for example, are priced at \$13.95 and are available from Lee's Plastics in Detroit, Michigan.

While you can, understandably, be satisfied with the stock characteristics of the plain lens, don't overlook the possibilities of adding a few chrome bullets to augment their custom appearance. An additional outlay of two or three dollars will put you into business. It's fun, simple and inexpensive. The entire operation can be performed in less than an hour.



Photos by George Baris

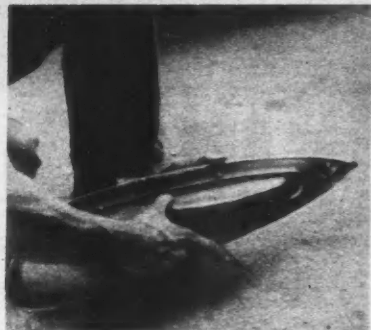




1. Dual lenses for '59 Chev are flattop model; Lee's kit is priced at \$13.95.



2. First step in replacing lenses is to remove entire stock taillight assembly.



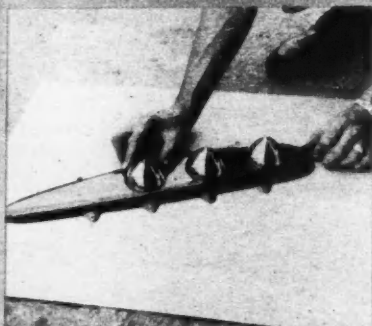
3. Snap-off the outer chrome rim by prying inner unit with a screwdriver.



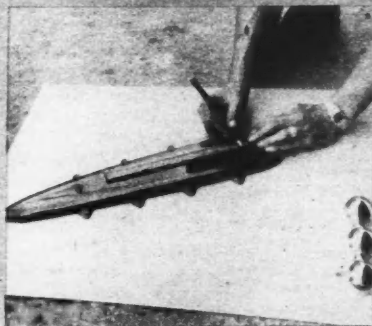
4. With chrome frame removed, unscrew lens mountings and remove lens.



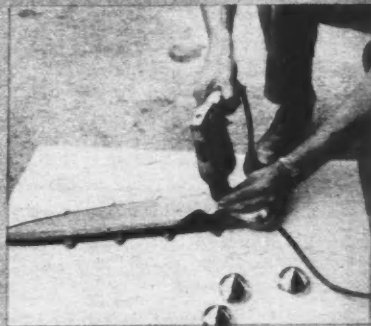
5. With stock lens removed, attach new plastic lens in same manner as the stock Chevy unit was attached. Install chrome frame, connect wiring and secure to car.



1. Remove stock lens as above. Layout new plastic lens, position the bullets.



2. With general locations in mind, next measure horizontal, vertical placement.



3. Mark locations with grease pencil. Carefully drill the holes with a drill.

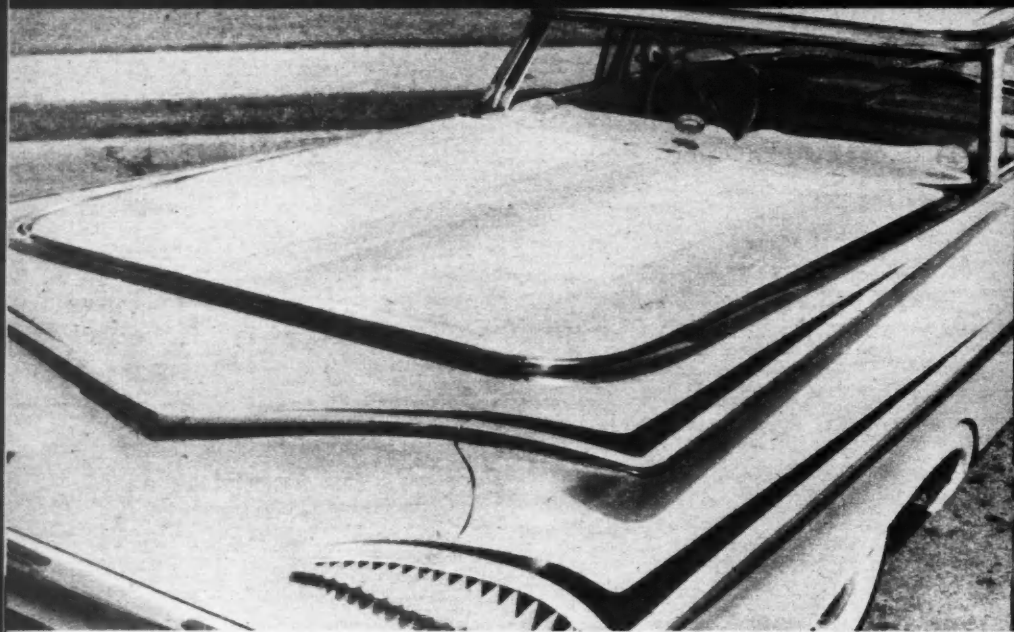


4. Use a metal screw to tap threads in the bullet. Be sure not to force action.

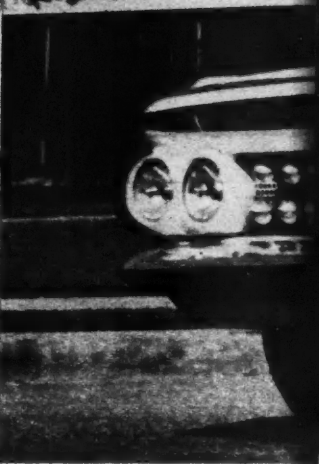


5. Final step is to attach the bullets to the lens. Be very careful not to scratch the surface. Then, attach the new plastic unit in stock frame, position and then secure.

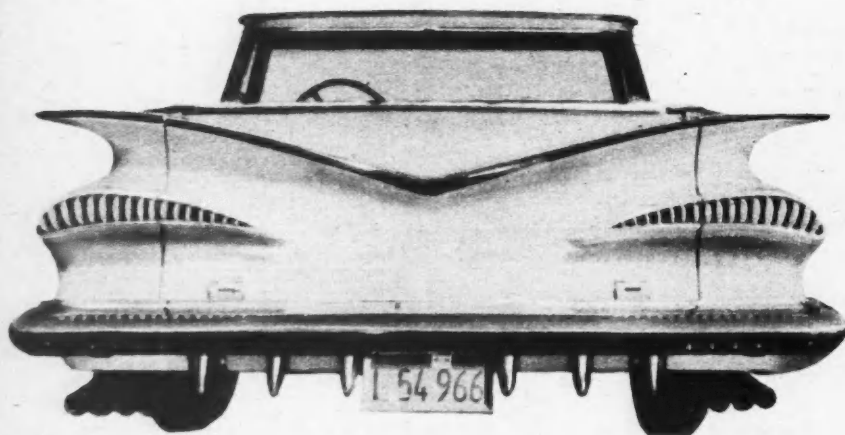
# CAMINO WITH CLASS



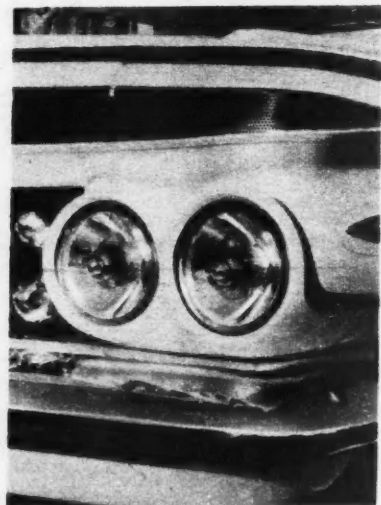
*Tarp was designed to repeat interior motif, two rows of pleats flowing the length of attractive white pearl Naugahyde covering. MartinezKustom Interiors did stitching. Base is plywood.*



Photos by George Barris



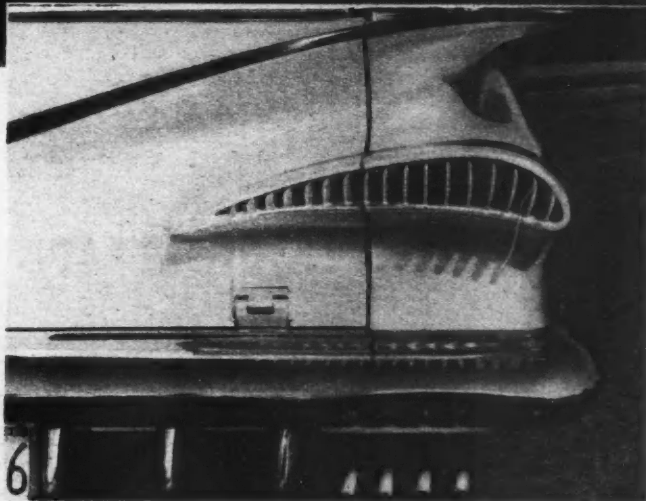
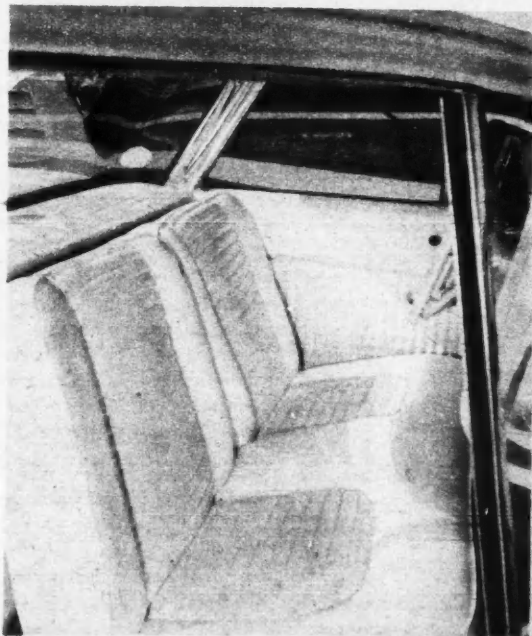
*Molded deck on Camino has placed license below bumper, cleaned up rear-end. Extra Impala vertical guards lend to illusion of width, flanged multi-exhaust ends.*



*English Lucas head lamps replace stock units; frenched rims '58 Merc. Fender scoops lengthened, filled with fine mesh.*



*Jim Seaton gave Barris Kustom the chore of turning his '59 El Camino into a clean, classic custom, to go along with 4 twin rods and customs he owns, all painted pearl.*



*Extended taillight housings mount flat red plastic lenses in frenched openings, vertical ribs are frosted. Chev also has chrome bullets on mesh grille, custom hubcaps on chromed reversed rims. Spots are dummies. It's lowered moderately.*

*Well padded interior of pearl Naugahyde is tastefully done in full rolls with pleated centers. All interior trim is chromed. Rugs are of white Acrilan fur, making the dazzling interior a real show place. Matching exterior scalloped in burgundy.*





## LANGHORNE IN MINIATURE

*Pint-size speedsters initiate infield floor of famed speedway in Eastern States Championship*



One-hundred twenty-five quarters were on hand for the second annual Pennndel  $\frac{1}{4}$  Midget Association's huge Eastern Championships. The site for all action was on the floor of the infield where some five thousand spectators saw Ron Bilger win both "B" Modified and "Full" Modified classes in his homemade racer.

Setting fast pace for fellow competitors, Don Kenison (left) Farmingham, Mass., holds his Moss speedster close to pole pylon on the  $\frac{1}{2}$ th oiled clay oval. Event was sponsored by Bucks County Market and Auction of Trevoze, Penna.

CAR CRAFT

Under the lights, Tony Picciotti (no. 3) from Woodbourne, Pa., tours his Kurtis Kraft thru traffic on way to 2nd place victory in "Full" Modified; Tony also checked in with a third in "B" Modified.

Look at that gold! Happy winner is Ronnie Bilger, Penndel, Pa. Driving a homemade car, 11 yr. old Ronnie was fastest car in "B" Modifieds, took class, then made engine swap and repeated in Full Modified division also; set new one lap track record of 8.94 seconds.

All the way from New England area, Car Craft Magazine Spl. was on hand for big Eastern meet. Susan Foote, chauffeur, chats with CC photographer, John Eddy. Entries were restricted to those east of Mississippi River. Eastern seaboard cars made up bulk of entries.

All cars were subjected to a rigid inspection at pitgate. Roll bar height, adequate brakes, steering, cockpit size were just a few of the items that were carefully scrutinized by alert Penndel technical officials. This policy could well be applied at all large regional and national events for coming year.



Photos by John Eddy and Woody Higgins



Those are victory smiles on the faces of John Ruszin and his dad Charles, from Briston, Penna. Veteran driver Ruszin piloted their homemade quarter midget to a checkered flag win in the always highly competitive "Stock" division.

## 1/4 - 1/2 MIDGET BULLETIN BOARD



Young fem leadfoot, Susan Foote, sits at the helm of the CAR CRAFT MAGAZINE SPL, now scorching New England quarter midget tracks. Rep John Eddy in rear.



### ONE HORSEPOWER PER INCH

Last month's editorial deadline did not permit publication of the comparison results of horsepower tests made during the recent four part quarter midget engine series featured in the October, November, December '59 and January '60 issues. These tests were conducted by Kong Jackson of Jackson Engineering, Research and Design, co-author of the articles, on his engine dynamometer specifically designed for wringing out the small, but potent Continental AU7R model powerplants. The comparisons were made from the standard 2.5 horsepower rating of the basic quarter midget engine. Five classifications are listed in the comparison chart but the first division listed as 'Novice' is merely a breaking in division for tyro drivers and cars. The engine modifications allowed in this class are only moderate and those that merely add to engine life rather than extreme performance as found in the following classifications. The four remaining racing classifications though are those that are very competitive divisions where a sharply turned engine is needed to make the winner's circle consistently.

### HORSEPOWER COMPARISON CHART

CLASS	FUEL	HP	RPM
Novice	Gas	2.57	5,000
Class I "Stock"	Gas	3.38	6,600
Class II "Modified"	Gas	5.51	7,000
Class III "Open Gas"	Gas	6.86	10,000
Class IV "Open Fuel"	Methanol	8.38	10,000

Just a few of the pint-size QM handlers that participated in the recent Klamm Park polio benefit races staged by the active Kansas City Quarter Midget Club.

### GLENDALE GOES FUEL

California's active Glendale Quarter Midget Association recently announced that the 'Open Fuel' classification has been added to their established three class racing divisions. Stock - Modified - Open Gas is now augmented with the 'Open Fuel' class under the following rules and specifications:

#### CLASS IV 'Open Fuel'

All engines must be flathead (side valve)

type. No spraying of fuel into engine under pressure above atmospheric.  
Maximum engine size 8.3 cubic inches.  
Driver ages: 4 through 15.

Fast time for Glendale's banked asphalt oval is seven seconds flat. The track is located at the end of Colorado Boulevard just off San Fernando Road. Racing takes place on Sunday afternoon - all visitors are welcome.

## TRACK LISTINGS

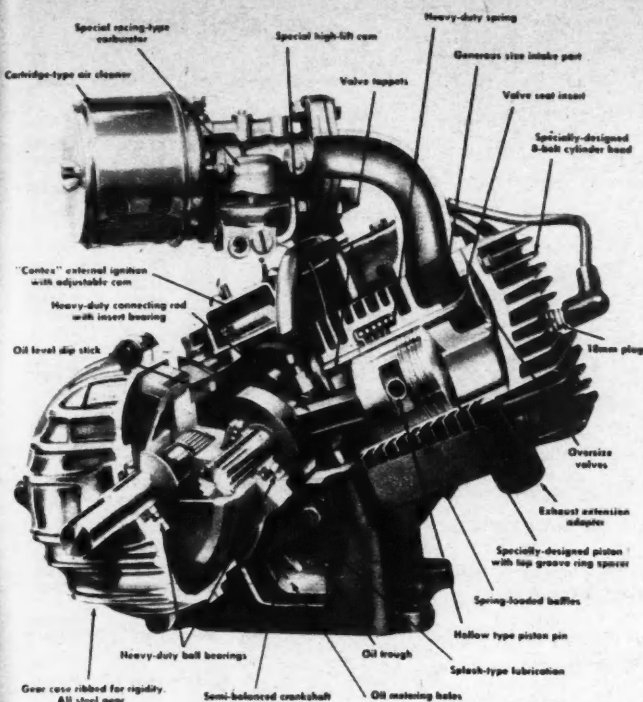
### PHOENIX, ARIZONA

### Arizona Quarter Midget Association

TRACK: asphalt. RACE DATE: Summer - every Saturday night, winter - every Sunday afternoon. QUALIFYING: Saturday night 6:30-8:00, Sunday afternoon 1:30 to 2:30. CLASSES: Stock - Modified - Open Fuel. GENERAL RULES AND REGULATIONS: All cars must be equipped with the following safety features, approved roll bar, safety seat belt, bumpers front and rear, positive brake, outside ignition switch, fully extended metal firewall, cut-away belly pan exposing the underneath side of engine compartment. DRIVERS: approved crash helmet, goggles, leather gloves and long sleeved protective apparel. ENGINE SPECIFICATIONS: 'Stock' (junior 4-8, senior 9-15) 7.3 cubic inch

four-cycle engines only. Following modifications allowed: carburetor, oil dipper, removal of fly-wheel screen, muffler, governor, starter pulley, advance stator plate, bored exhaust port - .875 maximum, valve guides, special springs, keepers - stock size only, battery ignition, any gearbox, one wheel drive. 'Modified' (ages 4-15) 7.5 cubic inches four-cycle engine only. No alterations to stock cam, flywheel 27 ounces or more, one wheel drive only, all other modifications allowed. 'Open Fuel' (ages 4-15) 8.3 cubic inches four-cycle engines only, all modifications allowed, two-wheel drive optional. TRACK LOCATION: Grand Avenue at 63rd Avenue, Glendale, Arizona.





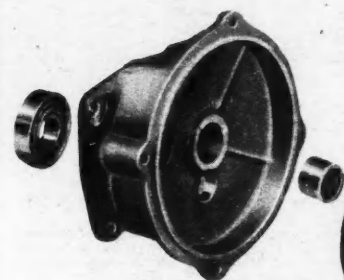
Above is a cut-away illustration showing construction of new Continental AU75-R, which is specifically designed for Q. M.

## Race-bred design and quality features spell rugged dependability for new racing Connie

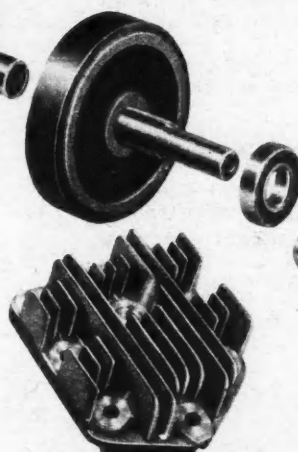
CONTINENTAL MOTORS has just introduced the AU75-R. This engine was designed specifically for the stresses of quarter midget racing. Conforming to racing specifications, it develops high speed, fast acceleration, and is extremely rugged.

Besides the Contex ignition system featuring adjustable cam for optimum timing, and breaker points and condenser mounted on top of the crankcase under a quick-removable cover, the AU75-R has a specially designed fuel induction system, engineered as a unit, for efficient use of gasoline. It includes a racing type carburetor, oversize valves, ports, and manifold, cartridge type air-cleaner, high-lift cam, alloy steel valve inserts, and heavy valve springs. Piston and head are also special. A battery ignition with 6-volt coil and ultra-light flywheel are included as standard equipment.

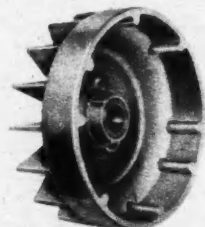
Heavy-duty 6:1 reduction gear with one-piece all-steel gear-and-shaft and ball bearings. Case is finned for rigidity.



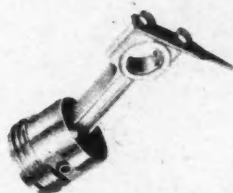
Racing crankshaft of forged steel heavy counterweights for smooth operation, long life.



Heavy-duty 8-bolt head with deep fins. The head is tapped for 18-mm racing type plugs.



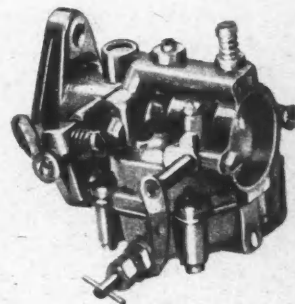
A special ultra-light flywheel for rapid acceleration. It weighs less than 1 1/2 pounds.



New piston and connecting rod have spacer ring to reduce groove wear on piston.



Special intake manifold has oversize passage with smooth walls to help fuel flow. Racing carburetor contains a large venturi for high-volume flow of fuel.



## LOADED LIGHTWEIGHTS



mum class allowances were set up it was only natural to use these industrial sizes as a foundation, since the motorcycle engines must be considered late comers. As is, these limitations subject many of the class "B" motorcycle engines to fall into the middle or bottom of their class, sacrificing cubic inches. A classic example of this are the 125cc (7.6 cu. in.) bike engines which have to compete against dual Clintons possessing 11.5 cubic inches in a class that limits displacement to 11.6 cubic inches.

The regulations established by the Go Kart Club of America, divide competition classes into three groups according to cubic inch displacement. Each displacement division is further classified into a *low* and *high* priced field, engine cost being the deciding factor.

Another English offering in the form of potential kart engines are the 125 and 175cc BSA two-strokes. Heads, mags, Pearson 15" conversion barrels available. As with many bike engines, years of use have made parts easy to obtain.



### OKCA NATIONAL RULES AND SPECIFICATIONS:

**CLASS A**  
5.0 cubic inch or 95cc maximum displacement, engine retailing UNDER \$100.

**CLASS A "SUPER"**  
5.0 cubic inch or 95cc maximum displacement, engine retailing OVER \$100.

**CLASS B**  
11.6 cubic inch or 190cc maximum displacement, engine retailing UNDER \$200.

**CLASS B "SUPER"**  
11.6 cubic inch or 190cc maximum displacement, engine retailing OVER \$200.

**CLASS C**  
16.5 cubic inch or 270.385cc maximum displacement, engine retailing UNDER \$250.

**CLASS C "SUPER"**  
16.5 cubic inch or 270.385cc maximum displacement, engine retailing OVER \$250.

The competition "A" and "B" classes, as they are established, place the motorcycle engines at a slight disadvantage. "C" divisions though

CONTINUED ON PAGE 56

## MOTORCYCLE ENGINES

ENGINE	SIZE (cu. in.)	HP	RPM	PRICE	CLASS
<b>Villiers</b>					
90cc (5.5)	2.8	4000	\$138	B	
140cc (8)	6.3	5500	\$200	B Super	
175cc (10.5)	7.7	5100	\$205	B Super	
197cc (12.03)	8.3	4000	\$219	C	
240cc (15.1)	15	4500	\$285	C Super	
<b>Excelsior</b>					
250cc (15.3)	14.5	5000	\$75 (used)	C	
<b>Zundapp</b>					
150cc (9.1)	8	5400	\$300	B Super	
200cc (12.2)	13	5500	\$300	C Super	
245cc (15)	18	5500	\$300	C Super	
<b>Yamaha</b>					
125cc (7.6)	6.8	6000	\$219	B Super	
200cc (12.2)	14.5	6000	\$340	C Super	
<b>Malco</b>					
174cc (10.7)	18	6400	\$250	B Super	
247cc (15.3)	18	6000	\$250	C Super	
<b>Lambretta</b>					
*125cc (7.6)	5.0	4800	\$175	B	
*150cc (9.1)	6.0	4800	\$175	B	
*175cc (10.7)	9.5	5300	\$175	B	
<b>Puch</b>					
175cc (10.7)	12.3	6200	\$225 to 275	B Super	
250cc (15.3)	16.5	5800	\$275	C Super	
<b>Harley Davidson</b>					
125cc (7.6)	4	6000	\$224	B Super	
165cc (10.06)	5.3	6000	\$264	B Super	
<b>BSA</b>					
125cc (7.6)	5	5500	\$168	B	
175cc (10.7)	10	5500	\$195	B	
<b>BMW (Austria)</b>					
** 50cc (3.06)	2.5	7500	\$ 75	A	
<b>Benelli</b>					
50cc (3.06)	3.6	7000	\$125	A Super	
<b>Rotax</b>					
125cc (7.6)	7.5	7500	\$225	B Super	
<b>Aermacchi</b>					
125cc (7.6)	7.5	7500	\$190	B	
<b>Rumi</b>					
125cc (7.6)	10	10000	\$240	B Super	

All prices quoted are for new engines with transmissions unless noted. Prices are subject to change. Horsepower and RPM ratings are for stock engines.

NOTE: \*pre 1959 models, no transmissions  
\*\*no transmission

## INDUSTRIAL AND CHAINSAW ENGINES

ENGINE	SIZE (cu. in.)	HP	RPM	PRICE	CLASS
<b>McCulloch</b>					
One/40	4.9			\$145	A Super
One/50	4.9			\$175	A Super
One/60	4.8			\$215	A Super
One/70	5.3	7	7000	\$230	A Super
One/80	5.3	7	7000	\$320	A Super
**77	7.3		6000	\$325	B Super
90	9.9	10	7800	\$405	B Super
MC-10	5.3	6.5	12-15000	\$125	A Super
<b>Hemelite</b>					
Series 7	5.99	6	5000	\$300	A Super
<b>West Bend</b>					
**510	5.10	3	4500	\$84.50	A
**645	6.45	4	5500	\$89	A
**700	7	5	5500	\$89.50	B
<b>Clinton</b>					
**A-400	5.75	2.5	4500	\$51.35	A
**E-50	5.75	5	5200	\$89.45	A
A-490	5.75	2.5	3800	\$51.35	A
E-65	5.75	4.5	6000	\$89.45	A
<b>Power Products</b>					
AM-47	4.7	2.5		\$43	A
AM-47	4.7	3 1/4	4800	\$71.31	A
AM-51	6.1	5.5	5000	\$87.75	B

NOTE: All prices are subject to change.  
\*These prices include transmissions, etc. Others are powerplants only with direct drive.  
\*\*Discontinued, but still available.

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### CUSTOM SHOW CARS (TB-181)

Presenting: the pick of the show customs, created by America's top customizers. Author George Barris reveals how he blends present with future in "Space Styled Customs." You'll go for his chapters on "Sketch-Pad Styling," "Customizing with Paint," "Pickups on Parade" and "Tricks with Fabric."



### 1960 CUSTOM CARS ANNUAL (TB-189)

Maine, Louisiana, Missouri, Nevada... customs from every state in the U.S. are arrayed in the 1960 CUSTOM CARS ANNUAL, latest edition of this perennially popular automotive yearbook. It features customs of every description, cars that illustrate the latest twists in customizing.



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The most exciting collection of photographs of hot rods ever assembled under one cover keynotes the 1960 HOT ROD ANNUAL, latest edition of this enduring best-seller. Outstanding in both appearance and performance, these unusual cars are given the full pictorial treatment.

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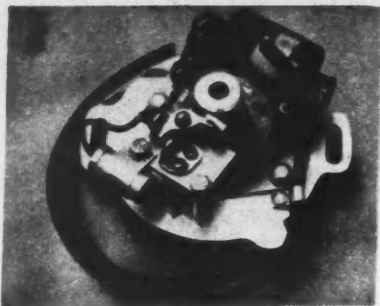
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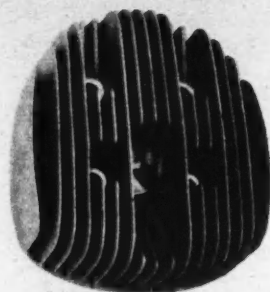
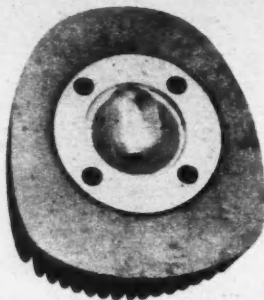
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Among Webco's many speed equip. parts is this mag, for Maico, Zundapp.



Also offered is competition cylinder head, greater fin area for cooling specially designed combustion chamber, fits Zundapp & Maicos. Differs for other engines.

## LOADED LIGHTWEIGHTS

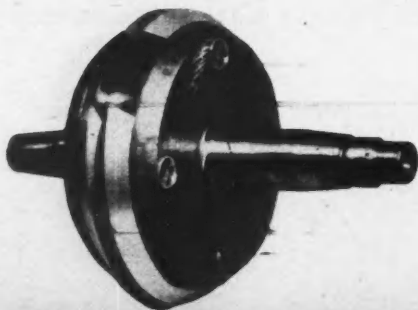
leaves itself wide open for all-out engine challenge. The engines found to be handicapped regarding cubic inches are those of the small displacement variety which are compelled to compete within the cubic inch boundaries of the "A" and "B" racing classifications. Even with relinquishing precious cubic inches in these divisions, the motorcycle two-strokes can hold their own and with a little super tuning—can wind up in the winner's circle more often than not. The "C" racing classification is a different story. Here, many single motorcycle engines and smaller bike engine combinations can qualify on equal, if not advantageous terms. Of twenty-six class "C" entries in last year's GKCA nationals, seven were powered by motorcycle engines. The winning first and second place karts were equipped with Villiers, a potent English two-stroke.

These two machines displaced only about 12½ cubic inches in a class that goes from 11.6 to 16.5

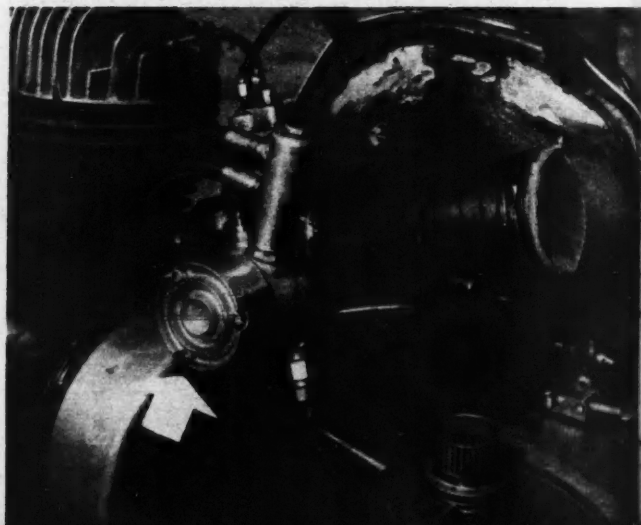
CONTINUED ON PAGE 58

Reworked carburetor on this Villiers is an Amal Monoblock, fitted with large reservoir (arrow) and special velocity tube.

High compression crankcase pads, mounted on flywheel counterweight, fits all Zundapp engines. Increase in power, improvement in balance noted. Cost at Webco is \$30.00.



German Zundapp 250cc, below, is one of the most potent "C" Super engines available. Stock ratings on this mill have been boosted from 18 HP at 5500 to 25 HP at 10,000 rpm. Webco, Inc. produces equipment for 250, 200, and 150cc Zundapps in form of heads, thin gaskets, hi-compression crank pads, comp. magneto. Engines run full roller bearings.



"The material you have in your book of Hot Rodding is the most complete and authentic I have seen."

Anyone interested in Hot Rodding should have these facts in this great book at their side."

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—How veteran hot rod enthusiasts get more power. An invaluable checklist of primary facts.

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**YOUR ENGINE'S ELECTRICAL SYSTEM**—High-performance ignition, mags, distributors, coils, condensers, spark plugs, batteries, generators.

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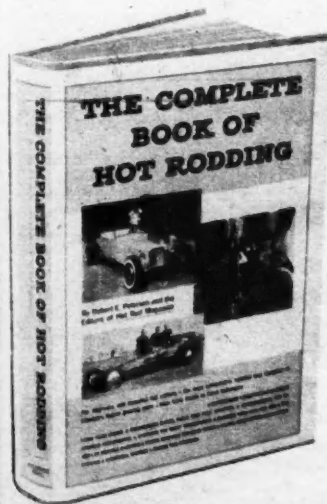
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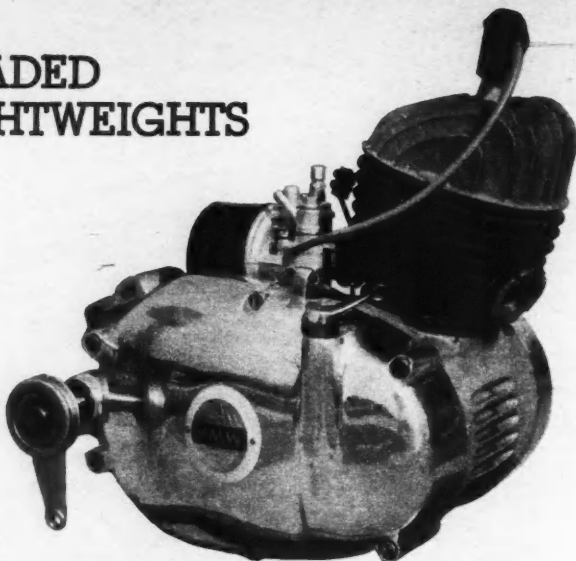


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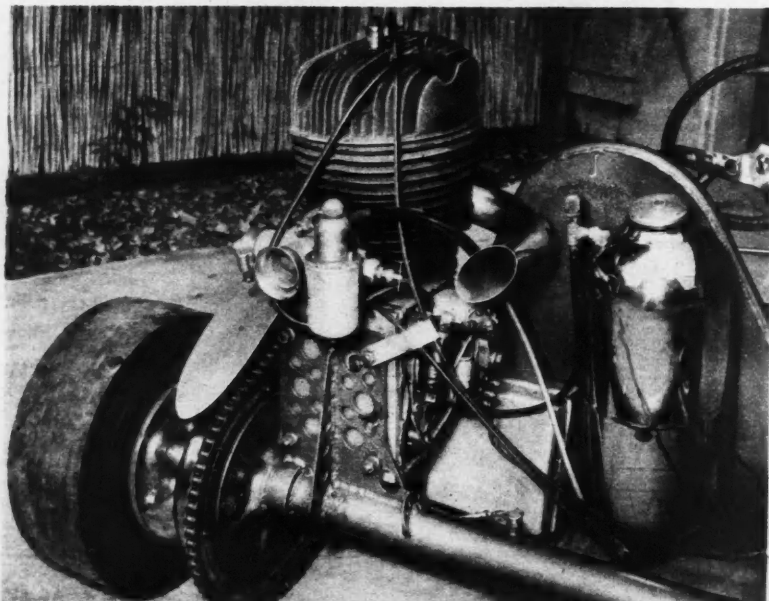
1 of 2 class "A" engines, the HMW of Austria, though half as big as its industrial counterparts, still put out 2.5 HP at 7500 rpm. It has no transmission, is lightweight.

cubic inches, yet they left the entire field behind, putting on their own show way out front. Other engines entered at the Nationals and currently being raced on the West Coast are Lambretta, Excelsior, Maico and Yamaha. Most of these machines are in strictly stock condition, right out of motorcycles with no engine modifications.

A glance at the price structure of

industrial engines reveals that this type ranges in price from \$43 to about \$400. The average cost for a good engine will run between \$70-\$125 each. About the best buy in the industrial engine field is the McCulloch MC-10 Kart engine, which is the only chainsaw type engine designed exclusively for kart racing. This five inch turns up near 15,000 rpm and costs only \$125. On an aver-

Installation of German Maico 15 inch bike engine on kart means one engine to maintain, less cost than multi-engined karts. Weight is over wheels, lots of space to mount gas tank. Height of cylinder also keeps engine in open, away from driver, insuring cooling. Box next to engine holds battery for ignition. Mags are available.





age, motorcycle and scooter engines cost a bit more since most of them are of larger displacement, running into the Class "B" and "C" categories. These former two-wheel powerplants average between \$200-\$300 with a low being \$75 for the 50cc (3.05 cubic inch) Austrian HMW and a high for the 250cc (15.3 cu. in.) Yamaha twin at \$349. These prices are for new engines. Used engines, of which there are many lying under work benches of motorcycle shops, could be purchased and re-built at a considerable saving as compared to list price. England's Villiers Company is planning on distributing two of their more popular models without transmissions to American buyers, thus cutting purchasing costs.

When comparing prices and engine specifications it is interesting to note that whereas a majority of industrial engines fall into classes "A" and "B", most of the two-stroke motorcycle engines are in "B" and "C" divisions. Only a couple of European imports in the cycle division qualify for class "A", these are the Austrian HMW and the Italian Benelli. The HMW is rated at 2.5 HP @ 7500 rpm, displaces 50cc (3.05 cu. in.) and costs about \$75 new. This tiny powerplant has no transmission, but runs a clutch and 6.1 reduction gears. It would compete with such names as the Clinton A-490 of 5.76 cu. in. displacement, 2.5 HP @ 3800 rpm. With almost half the size, same horsepower and twice the revs, this import costs not much more and weighs about the same as the Clinton. Two of these HMW's sleeved down to



Harley Davidson stands alone domestically with 125 & 165cc class "B" Super-engines, giving 4 & 5.5 HP, 6000 rpm.

around 45cc's (2.74 cu. in.) each could run in Class A "Super" with a total of 5.48 cu. in. A little speed tuning and they should turn up to 10,000 rpm with little strain!

Of more interest though, at least to most of the serious minded karters who are thinking about owning a real charger, are the bigger "B" and "C" engines, which are more readily available. The Japanese Yamaha 125cc machine (7.6 cu. in.) classifies as a "B" Super costing about \$219. Stock rating of this engine is 6.8 horsepower @ 6000 rpm, but much more can be had. A "works" (factory competition) engine of this size is rated at 14 horsepower @ 9500 rpm. On the other side of the fence, a Super 77 McCulloch displacing 7.3 cu. in. and costing \$290 will run in the same class as the Yamaha 125cc. The Super 77 is rated at 8.5 horsepower @ 6000 rpm.

Another hot bike engine that is proving its potential and frequently gives the "industrials" a hard time is the Villiers 197cc (12.03 cu. in.). The stock 197 puts out 9.3 HP @ 4000 rpm, runs minus a transmission, and costs only \$219 new (price includes transmission at this time). One of the hotter Villiers karts, owned and built by Bill Landefeld, puts out an estimated 15 HP @ 7000 rpm, it has hit as high as 8,200. This engine has received extensive modifications, and competes in "C" class.

The engine chart accompanying this feature offers a complete listing for your comparison of all industrial and motorcycle engines, their cost, horsepower rating, and racing classification. The word is out regarding the potential and popularity of motorcycle engines for kart racing: the curtain about ready to rise. Considering that many of these engines tip the scales a little more than their industrial counterparts should not bring worry to a prospective buyer when you consider that in competition a single bike engine of around 30-35 pounds will be running against two and sometimes three of the chainsaw brands totaling from 30-60 pounds plus. Even the relinquishment of a few cubic inches in some cases does not alter the fact that these bike engines still measure up if not surpass the industrials in performance, reason enough for thorough study when selecting your competition engine.

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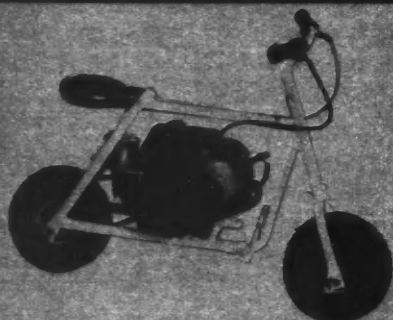
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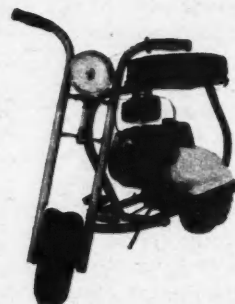


"Super-Flea" is 1960 offering by Bug Engineering, Box 91 West Covina, Calif. This proto-type mini-cycle features 3.6 HP Italian Benelli engine, 3 speed transmission (with neutral), rear brake. Tube frame cycle will sell for under \$200.

Ben Hunt & Son, 14 So. Palouse, Walla, Walla, Wash., manufactures 2 Caper Cycles, the Falcon using a 7" West Bend at \$159.00; the RoadRunner with a Clinton A-400 at \$129.00. Both have double loop frame, hand brake.



The Scrambler, Go-Kart Mfg., 6300 North Irwindale Road, Azusa, Calif. Just the thing for stowing in the trunk for trips. West Bend #510 engine, 3 1/2 HP, provides go. Has internal expanding brake, clutch, upholstered seat. \$149.



Glamorous Scoot-Nik comes from firm of Cummings Enterprises, Washington, Ga. It has cushioned fork assembly, 3 engines of 2 1/2 HP available, strong tube frame and rear brake. Lights, fender, chain guard on optional basis.



Luther Engineering, 6 Esther St., Pasadena, Calif., is now marketing it's "Viper-Cycle" with choice of Clinton A-490 or Power Products AH-47 engines at \$139.00. Features a double and higher tube frame, variable handlebar height.

"500" Cub gets there with aid from Power Products AH-47 2 1/2 HP engine. Available from the "500" Industries, Inc., Fremont, Nebraska. Comes with headlight at only \$129.95. Has auto. clutch, sturdy frame, friction type brake lever.









## CUSTOM QUERIES

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### A TRIO OF PONTIAC PROBLEMS

Dear George:

I have a '50 Pontiac that gives me two headaches. The first is the dip in the hood. How can I fill this in without resorting to lead work?

The second thing that bugs me about the Pontiac is the grille. What grille assembly can I install without cutting or reworking the grille shell?

—Steve Ramsey,  
Leaneck, N. Y.

Dear George:

On my '51 Pontiac, I want to fill in the center strip on the hood that is depressed. I also want to switch grilles with a better looking assembly. What should I use for these?

—Jack Macklin,  
Buffalo, N. Y.

Dear George:

I am in the process of customizing my '49 Pontiac and have two important questions. First, will the '49 Chevrolet hood and deck lid interchange with the Pontiac's panels? If not, could you tell me what will? Secondly, to get rid of the two-piece windshield, I want to install a '49 Oldsmobile one-piece glass. Is this a bolt-on form of item, or will it require a great deal of work?

—Richard DeBlasio,  
Waterbury, Conn.

Obviously, someone has problems. Nevertheless, though you have racked your brains for sometime to discover the solution, there is an answer to the problem which has plagued owners and customizers of the '49, '50 and '51 Pontiac cars. There is a replacement hood for the Pontiac and it does look very nice, but there is much metal work and trimming involved in installing this panel on the Pontiac. Either the '49 Chevrolet hood or the '49-'50 Oldsmobile hood will fit the Pontiac. This appears to be the best solution as far as a replacement panel is concerned, yet I remind you that unless you have had quite a bit of customizing experience, I don't think you should attempt this operation. If you take it to a reputable shop, it will probably cost you \$50-75 for this job. Expensive yes,

but a lot of stretching, reworking and fitting is necessary. If you don't want to fill the indentation with lead, there is not much else you can do to disguise the ridge. Since you do have this concave section on both the hood and trunk, why not try to make it a part of your car's overall custom appearance? You could rework the hood into a concave scoop, or perhaps a row or two of louvers would suit the Pontiac just fine. You might find the answer by adapting a later model hood scoop to the panel. You might think of the T-Bird scoop.

As for a grille, you might be able to find an accessory unit on the market for your Pontiac. This field is fairly complete, and there might be a nice replacement grille offered. Then, of course, you could build a special grille using perforated metal, mesh screen, drawer pulls or plastics. These are all very popular on the latest customs. Best bet is to try to work out a few designs perhaps employing only one of these new ideas. The one design that best suits your car, use. There have been how-to-do-it stories in past issues of Car Craft Magazine that can help you in actual construction of these assemblies. You might also find ideas by looking at some of the examples we've presented recently. Also, why not study a few outstanding '50 Chevy customs. The grille shape is basically the same found on the Pontiac of that year, give or take a little. If you see one you really like, you can probably duplicate it in your Pontiac.

The Oldsmobile windshield can be installed with minor alterations. All you need do is cut out the center posts and rubber sections and fit the one-piece glass to the opening.

The only way to fill holes properly is to concave them with a drill, to provide an edge for the filler material to hold to, and then braze them closed with a small flame. When the brazed hole is filled, work the panels out with a hammer, dolly, etc.

### PLYMOUTH FLIGHT

Dear George:

Recently I began customizing my '56 Plymouth. I am going the full semi-custom route, but I have a big problem because I don't know what make and model taillights I should use.

Do you have any suggestions as to a set of lenses that I can adapt to the Plymouth without going into too much of a reworking hassle? I've done enough metal work and fitting as it is.

—Elvis Kee,  
Dyerburg, Tenn.

I think you should choose a set of '58 Oldsmobile lenses for your Plymouth. Probably the best model would be the '58. These should fill the bill fine and they won't pose much of an installation problem. Another reason why you'll probably like these the best is that this is indeed a rare switch.

### BUICK BEAUTIFYING

Dear George:

My car is a '56 Buick, and I would like to know what type of grille I could use that will really make it stand out?

For taillights, how about a set of plastic lenses?

—Mike Vivian  
Cheyenne, Wyo.

For a sharp grille, adapt a bullet grille set-up to your car. The final design and placement of the bullets is, of course, up to you. Again, you might find some handy ideas on the pages of past Car Craft issues.

Plastic lenses are probably the best suggestion. You can trim small bullets or adapt drawer pulls to these lenses to add a further custom appeal to them.

### TUBE GRILLES

Dear George:

I would like some information on how to put a tube grille in a '49 Merc. Can you help?

—John Neal  
San Carlos, Calif.

If you have the grille now, I would suggest you read a few back issues to see how we installed some of the "kit" or already-made tubular grilles. You could then duplicate this by making your own brackets and fittings.

However, if you don't have one, I think you should purchase one of the new kits from California Custom Accessories. It's adjustable to any grille and just about the simplest unit on the market to install.

### TOO MUCH WORK

Dear George:

Not long ago I read of a '50 Chevy custom that had a one piece windshield from a '50 Olds. Is there a one piece windshield that could be safely put in a '51 Plymouth? If so, about what would the total cost be.

—Bill Bussey,  
Atlanta, Georgia

No, I'm sorry, Bill, you'll have to change the whole cowl to install a one-piece windshield. This job is way too big for what it's worth.

### ORIGINAL OLDS

Dear George:

I am customizing my '51 Olds and I would like to know if a rear bumper from a '55 Olds would fit my car? If not, could you give me some ideas? I would also like to know if there is a deep-dish steering wheel to replace my stock wheel? I know there is no way to restyle my taillights without a lot of work, but I was wondering how plastic fins would look on my stock lenses.

—Bill Anderson,  
Vinton, Iowa

You can use the '55 Olds bumper on your car, Bill. You'll have to change the bumper brackets, however. You'll probably be able to use practically any late model steering wheel for the deep-dish effect. The only problem confronting you here, is machining for proper shaft/spline fitting. A machine shop can do this for you with a minimum of cost. Just about the

simplest modification you can make is to add some plastic fins to your taillights. I would suggest you use 1/4" white plastic for best appearance and results.

#### FOUR FOR A FORD

Dear George:

I am confronted with problems concerning the correct methods and materials to use on my '47 Ford coupe. First of all, what is the best way to fill-in the fender seams?

Secondly, what material should I use to build a rolled rear pan, and how can I go about frenching a '49 Chevy license bracket to the pan?

Third on the list concerns the headlights. I've removed the parking lights and I can't decide now whether I should mount them in a lower position or install quad headlights. If I decide in favor of the quads, what assembly should I use?

Finally, I am thinking of installing '55 Pontiac rear bumpers. Is this a good idea?

— Jim Reilly  
Poughkeepsie, N. Y.

The proposed alterations you have outlined sound as though they will make a great improvement in the appearance of your '47 Ford. That's a difficult model to work with, although there are several outstanding customs based upon that car.

To fill-in the fender seams, the only way to perform this operation correctly is to first weld the seams solid. Then, lead them in and smooth. I would suggest that you check a few how-to-do-it articles in Car Craft and study the finishing processes concerned with final metal smoothing.

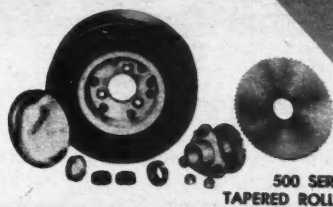
Roller pans were covered in the September '59 issue of Car Craft. I would suggest that you first purchase some 20 gauge cold rolled stock metal to use. Then, weld the metal to the car, filling the sections you want to be filled. You'll probably have to trim and fit to get the right appearance for the car. Turn the metal under for the rolled effect.

Once you have finished the rear pan, position the Chevy license bracket on the pan. Then, all you have to do is weld the bracket securely to the pan and lead the surfaces in. Once again, it would be of benefit if you study the finishing processes on the how-to-do-it articles.

If you want the best custom appearance, choose the quad headlight treatment. The best assembly for the '47 Ford is the '57 Chrysler Imperial component set.

Since you will have a rolled pan and Chevy license bracket on the rear, I presume you want the Pontiac bumpers for final appeal. This will be fine if you center the license plate between the bars. If you have a chance to get a 'deal' on the Pontiac bumpers, buy them. But, if you don't have an 'in' I would suggest you try the '60 Buick split bumpers instead. They're thinner and are not often seen.

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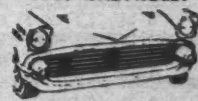
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1959 CHEVROLET



1958 CHEVROLET



1957 CHEVROLET



1956 CHEVROLET



1955 CHEVROLET

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## LETTERS

DETROIT DANDY

Dear Sir:

I have been reading Car Craft for a long time and have seen many sharp cars. I would like to see my car in your magazine. She is a 1953 Ford Mainline. I have put in a 1957 Studebaker grille bar and 1956 Ply-



mouth parking lights. Also, I have put a 1958 Chevy grille screen behind the bar. I have installed flat lucite taillight lenses in the rear while up front I have '56 Ford headlight rims. She has a finish of Colonial Blue with an Eggshell White top.

— Jerry Socall,  
Detroit, Michigan

The various grille component adaptation is sharp, Jerry. Other '53 Ford owners might be interested.— Ed.

QUARTER MIDGET RACING RULES

Dear Sir:

We are interested in establishing a new set of racing rules for our quarter midget association. We had rules of our own last year but they didn't prove too successful so we are discontinuing them. We also would appreciate any and all information that you might pass on as to how to go about measuring the cubic inches of an engine for legality—and any suggestions you have regarding satisfactory insurance for our weekly events.

Thanking you in advance,

— Bob Stomebraker  
Huntington Quarter Midget  
Club  
Huntington, Indiana

Dear Sir:

Will you please forward me the address of the National Quarter Midget Association so that we may contact them for a set of racing rules and specifications for our association.

— Gene Tatham  
N.H. Quarter Midget  
Association  
Manchester, New Hampshire

At the present time there is no National Quarter Midget Association governing quarter midget activity. A 'four' division racing classification was published in CAR CRAFT (October '59 through January '60) that accompanied step-by-step features illustrating how a Continental AU7R engine could be built up to within these 'four' division limitations. The rules and specifications presented were basically the same set of racing standards that have been employed at all large national and regional meets during the last few years. These rules and specs have proven themselves very compatible and fair for quarter midget racing and therefore go highly recommended for any association that is experiencing problems with their present system. It was CAR CRAFT's wish that associations from coast to coast adopt these standards to assist in the unification of quarter midget activity.

Insurance needn't pose a problem to any association. A local insurance broker or agent can easily furnish any association with adequate insurance concerning necessary liability and medical coverage.

The correct formula to employ when wishing to determine cubic inches of the Continental engine is as follows: Bore diameter X bore diameter X .7854 X stroke = displacement. Bore and stroke measurements are in inches — displacement in cubic inches.— Ed.

BROTHER'S CAR

Dear Sir:

Enclosed please find pictures of my brother's car. One of which I hope you can use in your letters column. It is a 1955 Ford Customline with the following modifications.

The hood, deck lid, and door handles have been shaved; the side trim shortened and Mercury station wagon taillights replace the stockers. The doors and deck lid now



operate by electric solenoids. Station wagon bumper guards are used in the rear. The grille is a tubular accessory. It is lowered seven inches in the rear and six in the front. It has full length lakes plugs and four Oldsmobile Starfire hubcaps. The seats and side panels are '55 Ford convertible and the headliner is perforated. The dash and garnish moldings are scalloped in gold and pinstriped in white. To top off the car it was painted with six coats of white enamel.



He has read Car Craft for over six years and I am sure he would appreciate seeing his car in it very much.

—Tom Cundy  
Cincinnati, Ohio

It's as good as done.—Ed.

#### 'FLIP-TOP FORD'

Dear Sir:

I have been buying your magazine for some time now and think it's tops. Enclosed are some photos of my '53 Ford convertible. It has been completely nosed and decked, and the grille is of my own design. The



car has been lowered 2" both front and rear and the taillights have been frenched using Olds lenses. Custom spinners and lakes plugs have also been added. I am a member of the Road Gents of Akron in which I hold the office of secretary. This is my first custom and I sincerely hope my car rates a spot somewhere between the covers of your great mag.

—Steve Hoot,  
Akron, Ohio

Hoot man, it sure does.—Ed.

#### CHOICE CHEVY

Dear Sir:

I have been a constant reader of Car Craft for quite some time and think it is the greatest. Enclosed are a few snapshots of my '52 Chev hard-top.

The hood and trunk have been shaved and the grille has been changed to a '51 Chev straightbar grille. It also has been lowered 5-inches in the rear and 3-inches in front via blocks and chopped coils. The interior has rolled and pleated red and white Naugahyde with red carpets to match. The car is painted jet black.



The engine sports dual exhausts and dual carburetors. Future plans call for a Chev V8.

—John Hale  
Indianapolis, Ind.

## SHIFT FASTER

... with a Tornado Kit you can convert from column shift to the world's fastest floor shift!

Easy-to-install Tornado Conversion Kits contain complete linkage as shown. Everything you need to connect your transmission is right there... plus simple installation instructions.

Available for these cars:

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(unless rear trans housing is altered)  
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1959 Pontiac Interceptor Transmission  
1949-59 Chev  
1949-50 Olds  
1946-51 Lincoln Zephyr  
1948-54 Stude Commander  
1938 & later Packards

Note:

Kits won't fit automatic transmissions.



Tornado Kits have standard shift pattern.

How to Order: specify year and model car, also if overdrive or not. Enclose \$7.50 deposit (balance c.o.d.).

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<b>\$34.95</b> including shift lever and knob f.o.b. Oakland, Calif. Ship. weight 7 lbs.	
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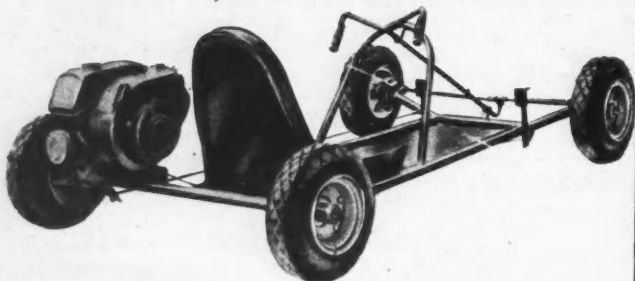
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Set of Four . . . \$29.95  
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59 CHEVY



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54 FORD



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55 CHEVY



55-56 FORD



53 FORD

At The Price You've Waited For. Sweeping Tubular Stainless Grille Bars Completely Pre-Assembled. Guaranteed Rust Proof - Full 3/4" diameter sections. Available For 52-59 Ford - 55-59 Chevrolet - 58 T Bird. Must Know Kind of Car and Year Model.

GIVE YEAR AND MODEL CAR WHEN ORDERING  
HONEST NO. 87 Completely Pre-Assembled Kit YOU PAY EXPRESS CHARGES

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Ball Bearing selective Progressive Linkage-replaces factory Vacuum set up on Chevrolet- Oldsmobile-Pontiac- triple carburetor manifolds. All moving parts are ball bearing. POSITIVE ACTION - NO DELAY IN CUT IN OF SECOND AND THIRD CARBS. UP TO 70 m.p.h. ON ONE CARB.



HONEST NO. 86 Each Complete Kit 11.95



## CHROME OUTSIDE TAILPIPES

Now in one complete package at a reasonable price - Kit Complete - Nothing Else to Buy - No welding necessary - mount along fender with simple tools - Stop discoloration of rear bumper and paint - must for station wagons - Packed in Pairs.

Complete Kit for Right and Left Side  
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For All Hub Caps-easily attached with screws  
HONEST No. 77 Each \$1.95 You Pay Postage

## MAKE WHITEWALLS OUT OF BLACKWALLS

13" - 14" 15" - 16" 4 Dazzling Colors in 16 oz. Spray Can  
Give Wheel Size  
BEST QUALITY  
\$4.95 Set of 4  
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Adjustable from 2" to 4" drop. Easily installed in minutes.

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For All Cars - with 2 Leaf Springs on Rear. Complete with U-Bolts. Kit: to lower rear 2" - \$3.95 to lower rear 3" - \$4.50 to lower rear 4" - \$4.95 State year & model Car You Pay Postage

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Both Street Type with self locking rings and our famous Drag Wheel Disc with holes already drilled and complete with screws and lock washers. 14" 15" or 16" Must Know Wheel Size Each \$2.70

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All Fords, Merc, Chevys', Cad., Dodge, Linc., Olds, Pontiac, and Studebakers

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Made of Oh so Soft, Fluffy, Angora Type Fur. One Size Fits Nearly All Inside Mirrors



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For all cars - Replaces original factory type.



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Heavy gauge Complete With Mounting Screws  
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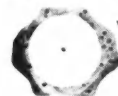
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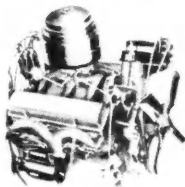
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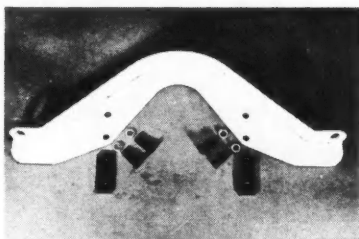


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New Improved Mounts Allow Front and Rear Adjustment To Allow For Different Adaptor Spacing - Universal Design Lets You Swap Cars Without Buying New Mounts. Through Bolt Mounting Eliminates Bonded Pad Break Worries. Makes Engine Swap A Cinch - Installs Late Model V-8 Engines Into Ford Merc-Stude and 6 Cyl. Chevrolet Frames.

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Buick To 41-48 Ford & Merc		B202A49	13.35
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Cad To 28-34 Ford		CA202A28	16.95
Cad To 35-40 Ford & Merc		CA202SP150	13.35
Cad To 41-48 Ford & Merc		CA202	13.00
Cad To 49-53 Ford & Merc		CA202A49	16.95
Chry. To 28-34 Ford		CH202A28	76.95
Chry. To 35-40 Ford & Merc		CH202SP150	13.35
Chry. To 41-48 Ford & Merc		CH202	13.00
Chry. To 49-53 Ford & Merc		CH202A49	16.95
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Chev. To 35-40 Ford & Merc		CV202SP150	13.35
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F-M To 41-48 Ford & Merc		FM202	13.00
F-M To 49-53 Ford & Merc		FM202A49	16.95
Olds To 28-34 Ford		OL202A28	16.95
Olds To 35-40 Ford & Merc		OL202SP150	13.35
Olds To 41-48 Ford & Merc		OL202	13.00
Olds To 49-53 Ford & Merc		OL202A49	16.95
Pontiac To 28-34 Ford		PO202A28	16.95
Pontiac To 35-40 Ford & Merc		PO202SP150	13.35
Pontiac To 41-48 Ford & Merc		PO202	13.00
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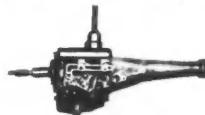
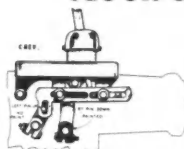
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Complete Conversion Kit To Convert Column Shift  
On Cars Listed Below To Floor Shift Operation.

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22 inch Gear Shift Extension for above floor shift  
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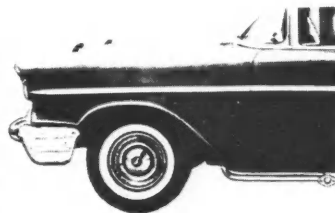
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Triple Chrome Plated 18 Gauge Steel Tubing  
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**GEARED TRANSMISSION**— runs in oil...eliminates upkeep of open chain drives. Allows lowest center of gravity. Provides highest efficiency. Delivers more power and speed to drive wheel.

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